

ABSOLUTE

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FIRE PROTECTION CO., INC.

2800 Hamilton Boulevard, South Plainfield, NJ 07080

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July 22, 2014

OCEAN FIRE COMPANY NO. 1

P.O. Box 1765

Point Pleasant Beach, New Jersey 08742

Absolute Fire Protection is pleased to submit the following proposal:

Price to furnish: One (1) Emergency-One, Custom Pumper,
 50' Boom, H-GAC Unit as per Bid Contract
 #FS13-12 JA01\$712,617.00

Delivery: 240 calendar days after receipt of order

Terms: Full Payment Due Upon Acceptance and Delivery of Apparatus

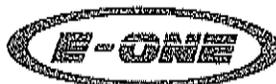
Quotation valid 60 calendar days.

Respectfully submitted by:

Absolute Fire Protection Company, Inc.

Michael J. Pizio
President

(seal)



CUSTOMIZED PRODUCT PRICING SUMMARY BASED ON CONTRACT

Product Description:
JA01

Number of Units:One (1)

* The following details shall be provided with Purchase Order from End User to H-GAC for customized products:

A.	Base Bid Price as in Bid/Contract No.FS13-12 JA01	(per single unit)	\$ 591,511.00
B.	Published Options added to Base Bid.....(per single unit).....		\$ 205,981.00
C. PER UNIT SUB TOTAL:		\$ 797,492.00

Change Order Provisions (if applicable):

D.	Dollar value of Unpublished Options added to base bid price per unit.....	\$ 293,501.00	
E.	Dollar value of Contract Items per unit deleted from Base Bid total.....	\$ (380,376.00)	
F.	PER UNIT CHANGE ORDER SUB TOTAL: (Change Order not to exceed 25% of "C") (Change order	-11%)	\$ (86,875.00)

G.	Order total without H-GAC fee for One (1) units	SUB TOTAL:	\$ 710,617.00
H.	H-GAC Administrative Fee (from Fee Schedules).....		\$ 2,000.00

J. TOTAL PURCHASE PRICE INCLUDING H-GAC \$ 712,617.00

K. COMMENTS AND NOTES:

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Specification for: BOROUGH OF POINT PLEASANT BEACH 1

TESTING COMPLIANCE STANDARD

NFPA Compliance

The E-ONE supplied components of the apparatus shall be compliant with NFPA 1901, 2009 edition.

H-GAC CONTRACT

Specification done accordingly to H-GAC contract number FS13-12 JAO1
The base model JOA1 was customized accordingly to the contract

The JOA1 base model is the following : E-One Typhoon, 4-Door Full-Tilt Welded Extruded Aluminum Cab, Six (6) Man Seating, Welded Extruded Aluminum Body, Single Axle, 1500 GPM Single Stage Pump, 500 Gallon Tank, Welded Extruded Aluminum HP75 - 75 FT. 550# Tip Load, Rear Mount Telescoping Ladder .

BUMPERS

Front Bumper

The vehicle shall be equipped with a one-piece 10" high bumper made from 10 gauge (0.135" nominal) polished stainless steel for corrosion resistance, strength, and long lasting appearance. It shall be mounted directly to the front frame extensions for maximum strength. The bumper shall incorporate two (2) stiffening ribs.

Front Bumper Extension

The bumper shall be extended approximately 20" from the face of the cab as required.

Bumper Reinforcement Backing

One (1) formed 1/4" steel plate "C" channel bumper reinforcement shall be installed directly across the chassis frame rail and extending the full width of the bumper up to the radius corners of the bumper.

Bumper Gravel Shield

The extended front bumper gravel shield shall be made of 1/8" (.125") aluminum treadplate material.

License Plate Holder

There shall be a license plate holder mounted on the center of the front bumper.

Bumper Notch

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

A "Half Moon" style notch shall be provided in the front bumper in line with the low "S" intake piping.

A tray shall be provided below the piping to facilitate hose connection. The tray shall be constructed of .125" aluminum plate and extend between the cab and bumper.

BUMPER TRAYS

Bumper Tray - Center

A hose tray constructed of 1/8" aluminum shall be recessed into the front bumper extension. The tray shall be located in the center of the bumper and be approximately 12" deep (11" to the top of the slats). One inch thick aluminum slats shall be included in the bottom of the hose tray to aid in the dissipation of water from the tray.

Divider - Front Bumper Tray

The center front bumper hose tray shall have an adjustable aluminum divider mounted side to side to create two storage areas, one in front and one behind the divider. The divider shall be constructed from .125" aluminum plate with a sanded finish.

Bumper Tray Securing Strap

A heavy duty black nylon strap with an aluminum quick-release buckle shall be provided for center front bumper tray. The strap shall be attached to the inboard side of the tray and shall not reduce the overall tray capacity.

FRAME ASSEMBLY

Frame Rail Construction

The frame shall consist of two (2) C-channel frame rails with heavy-duty cross-members. Each frame rail shall have the following minimum specifications in order to minimize frame deflection under load and thereby improve vehicle ride and extend the life of the frame:

Dimensions: 10-1/4" x 3-1/2" x 3/8"

Material: 110,000-psi minimum yield strength, high strength, low alloy steel

Section Modulus: 16.61 cu. in.

Resistance to Bending Moment (RBM): 1,827,045 in. lbs.

If larger rails are provided, the maximum height of each frame rail shall not exceed the 10-1/4" dimension by more than 1/2" in order to ensure the lowest possible body height for ease of access as well as the lowest possible vehicle center of gravity for maximum stability.

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

There shall be a minimum of six (6) cross-members joining the two (2) frame rails in order to make the frame rigid and hold the rails/liners in alignment. The cross-members shall be a combination of a formed steel C-channel design along with heavy duty steel fabricated designs as required for the exact chassis configuration. The cross-members shall be attached to the frame rails with not less than four (4) bolts at each end arranged in a bolt pattern to adequately distribute the cross-member load into the rail/liner and minimize stress concentrations.

All frame fasteners shall be high-strength Grade 8, flanged-head threaded bolts and nuts for frame strength, durability, and ease of repair. The nuts shall be Stover locknuts to help prevent loosening. The frame fasteners shall be tightened to the proper torque at the time of assembly.

The frame rails and frame liners shall be finished with black paint. The frame cross-members and frame mounted components (suspensions, axles, air tanks, battery boxes, fuel tank, etc.) shall be painted black.

The apparatus manufacturer shall supply a full lifetime frame warranty including cross-members against defects in materials or workmanship. Warranties that provide a lifetime warranty for only the frame rails, but not the cross-members, are not acceptable. **NO EXCEPTIONS.**

The custom chassis frame shall have a **WHEEL ALIGNMENT** in order to achieve maximum vehicle road performance and to promote long tire life. The alignment shall conform to the manufacturer's internal specifications. All wheel lug nuts and axle U-bolt retainer nuts shall be tightened to the proper torque at the time of alignment. The wheel alignment documentation shall be made available at delivery upon request.

Frame Liner

A 9-3/8" x 3-1/8" x 3/8" channel frame liner shall be bolted to each frame rail for added strength and rigidity. Frame liners shall be made of 110,000 psi minimum yield, high strength, low alloy steel. Each frame rail with liner shall have the following minimum characteristics:

Section Modulus: 28.74 cu. in.

RBM: 3,161,400 in. lbs.

The frame liners shall be inserted inside the open portion of the frame rails and shall run continuously from the rear of the frame to the centerline of the front axle to provide maximum frame strength at all critical load points.

Rear Underbody Support Frame

The body shall be supported at the rear by a steel frame extension bolted to the chassis frame rails. The frame rails and frame extension shall be isolated from the aluminum body extrusions by 5/16" x 2" fiber reinforced rubber.

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

The frame extension shall be built with (2) 2.5" sq. x .25 wall thickness x full width cross rails welded to (2) 2.5" sq. x .25 wall thickness side rails. The frame extension assembly will be welded to steel weldments, which are secured to the chassis frame with grade 8 5/8" bolts.

The frame extension shall not interfere with N.F.P.A. minimum requirements for angle of departure.

AXLE OPTIONS

Front Axle

The vehicle shall utilize an ArvinMeritor FL-943, 5" drop beam front axle with a rated capacity of 21,500 lbs. It shall have "easy steer" knuckle pin bushings and 68.83" kingpin centers. The axle shall be of I-beam construction and utilize grease-lubricated wheel bearings. The vehicle shall have a nominal cramp angle of 45 degrees, plus two (+ 2) degrees to minus three (- 3) degrees including front suction applications.

The front axle hubs shall be made from ductile iron and shall be designed for use with 10 hole hub-piloted wheels in order to improve wheel centering and extend tire life.

The front springs shall be parabolic tapered, minimum 4" wide x 54" long (flat), minimum three (3) leaf, progressive rate with bronze bushings and a capacity of 21,500 lbs. at the ground. Tapered leaf springs provide a 20% ride improvement over standard straight spring systems.

The vehicle shall be equipped with a Sheppard integral model M-110 power steering gear, used in conjunction with a power assist cylinder. The steering assembly shall be rated to statically steer up to a maximum front axle load of 21,500 lbs. Relief stops shall be provided to reduce system pressure upon full wheel cut. The system shall operate mechanically should the hydraulic system fail.

A 2-year/unlimited miles parts and 2-year labor axle warranty shall be provided as standard by ArvinMeritor Automotive.

In order to achieve maximum vehicle road performance and to promote long tire life, there shall be a wheel alignment. The alignment shall conform to the manufacturer's internal specifications. All wheel lug nuts and axle U-bolt retainer nuts shall be tightened to the proper torque at the time of alignment. The wheel alignment documentation shall be made available at delivery.

Shock Absorbers Front

Koni model 90 shock absorbers shall be provided for the front axle. The shocks shall be three way adjustable.

The shocks shall be covered by the manufacturer's standard warranty.

Front Axle Oil Seals

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

The front axle shall have Stemco oil seals with sight glass to check the lubricant level of the axle spindles.

Rear Axle

The vehicle shall be equipped with an ArvinMeritor RS-25-160 single rear axle with single-reduction hypoid gearing and a manufacturer's rated capacity of 27,000 lbs. The axle shall be equipped with oil-lubricated wheel bearings with ArvinMeritor oil seals.

The rear axle hubs shall be made from ductile iron and shall be designed for use with 10 hole hub-piloted wheels to improve wheel centering and extend tire life.

A 2-year/unlimited miles parts and 2-year labor rear axle warranty shall be provided as standard by ArvinMeritor Automotive.

SUSPENSIONS

Rear Suspension

The rear suspension shall be a pair of linear-rate leaf springs with auxiliary "helper" leaf springs and bronze bushings. The variable-rate springs with auxiliary springs ensure that the vehicle rides and handles smoothly under both loaded and unloaded conditions. The suspension shall be rated for the maximum axle capacity.

WHEEL OPTIONS

Front Wheels

The vehicle shall have two (2) polished (on outer wheel surfaces only) Alcoa aluminum disc wheels. They shall be forged from one-piece corrosion-resistant aluminum alloy and sized appropriately for the tires.

Front Wheel Trim Package

The front wheels shall have stainless steel lug nut covers (chrome plated steel lug nut covers not acceptable). The front axle shall be covered with American made Real Wheels brand mirror finish, 304L grade, non-corrosive stainless steel universal baby moons. All stainless steel baby moons shall carry a lifetime warranty plus a 2 year re-buffing policy. There shall be two (2) baby moons and twenty (20) lug nut covers.

Rear Wheels

The vehicle shall have four (4) polished (on outer wheel surfaces only) Alcoa aluminum disc wheels. They shall be forged from one-piece corrosion-resistant aluminum alloy and sized appropriately for the tires.

Rear Wheel Trim Package, Single Axle

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

The rear wheels shall have stainless steel lug nut covers (chrome plated steel lug nut covers not acceptable), or American made chrome plated plastic lug nut covers. The rear axle shall be covered with American made Real Wheels brand mirror finish, 304L grade, non-corrosive stainless steel, spring clip band mount high hats, DOT user friendly. All stainless steel high hats shall carry a lifetime warranty plus a 2 year re-buffing policy. There shall be two (2) high hats and twenty (20) lug nut covers.

TIRE OPTIONS

Front Tires

The front tires shall be Goodyear 425/65R22.5 tubeless type "L" range radial tires with G296 MSA highway tread.

The tires with wheels shall have the following weight capacity:

Max front rating 22,800 @ 68 mph.

Max front rating with Alco aluminum wheels - 24,400 @ 68 MPH (intermittent fire service rating if GAW is over 22,800)

The wheels and tires shall conform to the Tire and Rim Association requirements.

Rear Tires

The rear tires shall be Goodyear 12R22.5 tubeless type "H" range tires with G622 RSD mud and snow tread.

The tires with wheels shall have the following weight capacity:

27,000 lbs. (dual) @ 75 MPH.

The wheels and tires shall conform to the Tire and Rim Association requirements.

Tire Pressure Monitoring System

A tire pressure monitoring system shall be installed on the apparatus. The system shall include externally mounted sensors on the valve stem of each wheel and tire assembly. The air pressure of each individual tire shall be shown on the in-cab multiplex color display.

BRAKE SYSTEMS

Front Brakes

The front axle shall be equipped with Meritor DiscPlus EX225H 17 inch disc brakes.

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The brakes shall be covered by the manufacturer's standard warranty which is three years, unlimited mileage and parts only.

Rear Brakes

The rear axle shall be equipped with Meritor DiscPlus EX225H 17 inch disc brakes with a maximum rated capacity of 27,000 lbs.

The brakes shall be covered by the manufacturer's standard warranty which is three years, unlimited mileage and parts only.

Brake System

The vehicle shall be equipped with air-operated brakes and an anti-lock braking system (ABS). The brake system shall meet or exceed the design and performance requirements of the current Federal Motor Vehicle Safety Standard (FMVSS)-121, and the test requirements of the current NFPA 1901 Standard.

A dual-treadle brake valve shall correctly proportion the braking power between the front and rear systems. The air system shall be provided with a rapid pressure build-up feature, designed to meet current NFPA 1901 requirements, to allow the vehicle to begin its emergency response as quickly as possible.

A pressure-protection valve shall be installed to prevent use of the air horns or other air-operated devices should the air system pressure drop below 85 psi. This feature is designed to prevent inadvertent actuation of the emergency/parking brakes while the vehicle is in motion.

Two (2) air pressure needle gauges, one (1) each for front and rear air pressure, with a warning light and buzzer shall be installed at the driver's instrument panel.

The braking system shall be provided with a minimum of three (3) air tank reservoirs for a total air system capacity of 5,214 cu. in. One (1) reservoir shall serve as the wet tank and a minimum of one (1) tank shall be supplied for each of the front and rear axles. The total system shall carry a sufficient volume of air to comply with FMVSS-121.

Tank Capacities in Cubic Inches:

Wet	Front	Rear	Total
1,738	1,738	1,738	5,214

Spring-actuated emergency/parking brakes shall be installed on the rear axle.

A Bendix-Westinghouse SR-1 valve, in conjunction with a double check valve system, shall provide automatic emergency brake application when the air brake system pressure falls below 40 psi in order to safely bring the vehicle to a stop in case of an accidental loss of braking system air pressure.

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A four-channel Wabco ABS shall be provided to improve vehicle stability and control by reducing wheel lock-up during braking. This braking system shall be fitted to both front and rear axles. All electrical connections shall be environmentally-sealed for protection against water, weather, and vibration.

The system shall constantly monitor wheel behavior during braking. Sensors on each wheel transmit wheel speed data to an electronic processor, which shall detect approaching wheel lock-up and instantly modulate (or pump) the brake pressure up to five (5) times per second to prevent wheel lock-up. Each wheel shall be individually controlled. To improve field performance, the system shall be equipped with a dual-circuit design configured in a diagonal pattern. Should a malfunction occur in one circuit, that circuit shall revert to normal braking action. A warning light at the driver's instrument panel shall signal a malfunction.

The system shall also be configured to work in conjunction with all auxiliary engine, exhaust, or driveline brakes to prevent wheel lock-up.

To improve maintenance troubleshooting, provisions in the system for an optional diagnostic tester shall be provided. The system shall test itself each time the vehicle is started, and a dash-mounted light shall go out once the vehicle is moving above 4 MPH.

A 3 year/300,000 mile parts and labor Anti-Locking Braking System (ABS) warranty shall be provided as standard by Meritor Automotive.

Park Brake Release

One (1) Bendix-Westinghouse PP-5 parking brake control valve shall be supplied on the lower dash panel within easy reach of the driver.

Electronic Stability Control

The apparatus shall be equipped with a G4 4S4M Electronic Stability Control (ESC) system that combines the functions of Roll Stability Control (RSC) with the added capability of yaw - or rotational - sensing.

RSC focuses on the vehicle's center of gravity and the lateral acceleration limit or rollover threshold. When critical lateral acceleration thresholds are exceeded, RSC intervenes to regulate the vehicle's deceleration functions. The added feature of ESC is to automatically intervene to reduce the risk of the vehicle rotating while in a curve or taking evasive action, prevents drift out through selective braking, and controlling and reducing vehicle speed when lateral acceleration limits are about to be exceeded.

Intervention by the system occurs in three forms - engine, retarder and brake control. The ESC system uses several sensors to monitor the vehicle. These include a steering wheel angle sensor, lateral accelerometer, and yaw position sensor. ESC constantly monitors driving conditions and intervenes if critical lateral acceleration is detected or if the vehicle begins to spin due to low friction surfaces. The system provides control of engine and retarder torque as well as automatically controlling individual wheels to counteract both over steer and under steer.

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To further improve vehicle drive characteristics, the unit shall be fitted with Automatic Traction Control (ATC). This system shall control drive wheel slip during acceleration from a resting point. An extra solenoid valve shall be added to the ABS system. The system shall control the engine and brakes to improve acceleration slip resistance. The system shall have a dash mounted light that shall come on when ATC is controlling drive wheel slip.

3 year/300,000 miles parts and labor warranties for ESC, RSC, and ATC shall be provided as standard by Meritor Automotive.

AIR SYSTEM OPTIONS

Air Dryer

The chassis air system shall be equipped with a Bendix-Westinghouse AD-9 air dryer to remove moisture from the air in order to help prevent the air lines from freezing in cold weather and prolong the life of the braking system components.

Air Inlet

A 1/4" brass quick-release air inlet with a male connection shall be provided. The inlet shall allow a shoreline air hose to be connected to the vehicle, discharging air directly into the wet tank of the air brake system. It shall be located driver door jamb.

Isolated Air Reservoir

The air system shall have an additional 1738 cu. in. isolated reservoir. The supply side of the reservoir shall be equipped with a check valve and an 85 psi pressure protection valve.

Specified options shall be plumbed to the isolated air tank.

Auxiliary Air Tank Plumbing

The auxiliary air tank shall be plumbed to the following optional accessories, if equipped: Chassis air horns, brake system air outlet, air reel, light tower and or customer/dealer supplied pneumatic add-on(s).

Heated Moisture Ejectors

All air reservoirs shall be equipped with a Bendix DV-2 automatic reservoir drain valve which shall automatically eject moisture and contaminants from the reservoirs. The moisture ejectors shall be heated.

Air Lines

Air brake lines shall be constructed of color coded nylon tubing routed in a manner to protect them from damage. Brass fittings shall be provided.

Air Horns

Dual Grover air horns shall be provided, connected to the chassis air system. The horns shall be mounted through the front bumper. The front bumper shall have two (2) holes punched to accommodate the horns. A pressure protection valve shall be installed to prevent the air brake system from being depleted of air pressure.

Air Restriction Gauge

An air restriction indicator gauge with a 2" black bezel will be mounted in the dash panel. It shall provide a color coded warning indication of a clogged air filter.

ENGINES & TRANSMISSIONS

Transmission Selector

A push-button transmission shift module, Allison model 29538373, shall be located to the right side of the steering column within easy reach of the driver. The shift position indicator shall be indirectly lit for after dark operation. The shift module shall have a "Do Not Shift" light and a "Service" indicator light. The shift module shall have means to enter a diagnostic mode and display diagnostic data including oil life monitor, filter life monitor, transmission health monitor and fluid level. A transmission temperature gauge with warning light and buzzer shall be installed on the cab instrument panel.

Transmission Fluid

The transmission fluid shall be TransSynd synthetic.

Vehicle Speed

The maximum speed shall be electronically limited to 68 MPH as required by NFPA 1901.

Note: Maximum speed may be set at 65 MPH due to tire rating.

Engine/Transmission Package

Engine

The vehicle shall utilize a Cummins ISX12 engine as described below:

- 500 Horsepower
- Six (6) cylinder
- Variable Geometry Turbocharged
- Charge Air Cooled (CAC) 4-cycle diesel
- Cummins XPI high pressure fuel injection system
- Fuel cooler (when equipped with a fire pump)
- 729 cu.in. displacement

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- 500 gross BHP at 1800 RPM and a peak torque of 1645 lb.ft. at 1200 RPM with a governed RPM of 2100
- Bore and stroke shall be 5.11 x 5.91
- Compression ratio shall be 17:1
- Engine lubrication system shall have a minimum capacity, to include filter, of 43 quarts
- Cooled Exhaust Gas Recirculation (EGR)
- Delco-Remy 39 MD-HD 12 volt starter
- Interacta System
- Coolant filter with shut-off and corrosion inhibiting additive
- 18.7 cubic foot per minute air compressor
- After treatment system consisting of a oxidation catalyst and diesel particulate filter and selective catalyst reduction system
- Ember separator compliant with 2009 NFPA 1901 standard
- The engine shall be compliant with 2013 EPA Emission standards

The engine air intake shall draw air through the front cab grill. The intake opening shall be located on the officer (right) side behind front cab face with a plenum that directs air to the air filter. The air cleaner shall be a 11" diameter dry type that is easily accessed for service. Air cleaner intake piping shall be made from aluminized steel tubing with flexible rubber hoses. Air cleaner intake piping clamps shall be heavy-duty, constant-torque, T-bolt clamps to ensure proper sealing under all temperatures in order to keep dust and other contaminants out of the engine intake air stream and protect the engine.

The engine exhaust piping shall be a minimum of 4" diameter welded aluminized steel tubing. The muffler shall be mounted horizontally under the right-hand frame rail in back of the cab in order to minimize heat transmission to the cab and its occupants. The exhaust shall be directed away from the vehicle on the right side ahead of the rear wheels in order to keep exhaust fumes as far away as possible from the cab and pump operator position.

A 5-year/100,000 miles parts and labor warranty will be provided as standard by Cummins.

A copy of the Engine Installation Review stating the engine installation meets Cummins recommendations shall be provided as requested. The engine installation shall not require the operation of any type of "power-down" feature to meet engine installation tests.

Transmission

The vehicle shall utilize an Allison EVS4000P, electronic, 5-speed automatic transmission.

A transmission oil temperature gauge with warning light and buzzer shall be installed on the cab instrument panel to warn the driver of high oil temperatures that may damage the transmission.

The transmission shall have a gross input torque rating of 1675 lb. ft. and a gross input power rating of 580 HP.

The gear ratios shall be as follows:

1 - 3.51

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2 - 1.91

3 - 1.43

4 - 1.00

5 - .74

R - 4.80

The transmission shall be equipped with a fluid level sensor (FLS) system, providing direct feedback of transmission oil level information to the operator.

The transmission shall have a lubricant capacity of 51 quarts.

A water-to-oil transmission oil cooler shall be provided to ensure proper cooling of the transmission when the vehicle is stationary (no air flow).

The transmission shall contain two engine driven PTO openings located at the 1 and 8 o'clock positions. The automatic transmission shall be equipped with a power lock-up device. The transmission lock-up shall prevent down shifting of transmission when engine speed is decreased during pump operations, thereby maintaining a constant gear ratio. Transmission lock-up shall be automatically activated when placing pump in gear. Transmission lock-up shall be automatically deactivated when disengaging pump for normal road operation.

A 5-year/unlimited miles parts and labor warranty shall be provided as standard by Allison Transmission.

SECONDARY BRAKING

Jacobs Engine Brake

One (1) Jacobs engine brake shall be installed to assist in slowing and controlling the vehicle as required by NFPA 1901 for vehicles with gross vehicle weight ratings (GVWR) of 36,000 lbs. or greater. An on-off control switch and a high-medium-low selector switch shall be mounted in the cab accessible to the driver.

When activated, the Jacobs engine brake shall cut off the flow of fuel to the cylinders and alter the timing of the exhaust valves. This shall transform the engine into a high-pressure air compressor, driven by the wheels, and the horsepower absorbed by the engine in this mode shall slow the vehicle. The selector switch allows the driver to select the amount of retarding power.

When the on-off switch is in the "on" position, the engine brake shall be automatically applied whenever the accelerator is in the idle position and the automatic transmission is in the lock-up mode. If the accelerator is depressed or if the on-off switch is placed in the "off" position, the engine brake shall immediately release and allow the engine to return to its normal function.

Transmission Programming

Specification for: BOROUGH OF POINT PLEASANT BEACH I

The transmission shall include the Allison 2nd gear Pre-Select feature. This option will direct the transmission to down shift to second gear when the throttle is released and the Jacobs engine brake (or Telma retarder wired to activate with release of throttle) is engaged. This feature is designed to increase brake life and aid vehicle braking.

EXHAUST OPTIONS

Exhaust End Modification

The end of the exhaust tail pipe shall be modified to accommodate a Plymovent in-house exhaust extraction system. The tail pipe will be at 90 degrees and straight out below the side of body. A stop ring shall be provided on the tail pipe to properly position the Plymovent nozzle.

Exhaust Heat Shield

A heat shield shall be provided on the exhaust to provide protection to the compartment floor.

Exhaust Wrap

The exhaust shall be wrapped with a silica-based woven textile material specifically designed for high temperature usage. The material shall be installed in a spiraled configuration from the engine turbo to the exhaust flex pipe. A stainless steel wire mesh shall then be installed over the material for additional protection. The stainless steel wire mesh shall be collared at both ends with a stainless steel band which shall in turn be welded to the exhaust pipe for additional security.

COOLING PACKAGE

Engine Cooling Package

Radiator

The cooling system shall include an aluminum tube-and-fin radiator with a minimum of 1,408 total square inches of frontal area to ensure adequate cooling under all operating conditions. There shall be a drain valve in the bottom tank to allow the radiator to be serviced. A sight glass shall be included for quick fluid level assessment. The radiator shall be installed at the prescribed angle in order to achieve the maximum operational effectiveness. This shall be accomplished according to established work instructions and properly calibrated angle measurement equipment.

Silicone Hoses

All radiator and heater hoses shall be silicone. Pressure compensating band clamps shall be used to eliminate hose pinching on all hoses 3/4" diameter and larger. All radiator hoses shall be routed, loomed, and secured so as to provide maximum protection from chafing, crushing, or contact with other moving parts.

Coolant

The cooling system shall be filled with a 50/50 mixture of water and antifreeze/coolant conditioner to provide freezing protection to minus 40 (- 40) degrees F for operation in severe winter temperatures.

Coolant Recovery

There shall be a coolant overflow recovery system provided.

Charge Air Cooler System

The system shall include a charge air cooler to ensure adequate cooling of the turbocharged air for proper engine operation and maximum performance.

Charge Air Cooler Hoses

Charge air cooler hoses shall be made from high-temperature, wire-reinforced silicone to withstand the extremely high temperatures and pressures of the turbocharged air. The hoses shall incorporate a flexible hump section to allow motion and misalignment of the engine relative to the charge air cooler. Charge air cooler hose clamps shall be heavy-duty, constant-torque, T-bolt clamps to ensure proper sealing under all temperatures in order to keep dust and other contaminants out of the engine intake air stream and protect the engine.

Fan/Shroud

The fan shall be 30" in diameter with eleven (11) blades for maximum airflow and dynamic balance. It shall be made of nylon for strength and corrosion resistance. The fan shall be installed with grade 8 hardware which has been treated with thread locker for additional security. A fan shroud attached to the radiator shall be provided to prevent recirculation of engine compartment air around the fan in order to maximize the cooling airflow through the radiator. The fan shroud shall be constructed of fiber-reinforced high temperature plastic. The shroud shall be specifically formed with curved surfaces which improves air flow and cooling.

Transmission Cooler

The cooling system shall include a liquid-to-liquid transmission cooler capable of cooling the heat generated from the transmission. When a transmission retarder is selected, the cooler shall have an increased capacity to handle the additional heat load.

FUEL SYSTEMS

Fuel System

One (1) 65 gallon fuel tank shall be provided. The tank shall be of an all-welded, aluminized-steel construction with anti-surge baffles and shall conform to all applicable Administration (FHWA) 393.65 and 393.67 standards. The tank shall be mounted below the frame rails at the rear of the chassis for maximum protection. The tank shall be secured with two (2) wrap-around

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T-bolt type stainless steel straps. Each strap shall be fitted with protective rubber insulation and shall be secured with Grade 8 hardware. This design allows for tank removal from below the chassis.

The fuel tank shall be equipped with a 2" diameter filler neck. The filler neck shall extend to the rear of the vehicle behind the rear tires and away from the heat of the exhaust system as required by NFPA 1901 Standard for Automotive Fire Apparatus. The open end of the filler neck shall be equipped with a twist-off filler cap with a retaining chain.

The tank shall be plumbed with top-draw and top-return fuel lines in order to protect the lines from road debris. Bottom-draw and/or bottom-return fuel lines are not acceptable. A vent shall be provided at the top of the tank. The vent shall be connected to the filler neck to prevent splash-back during fueling operations. A .50" NPT drain plug shall be provided at the bottom of the tank.

The tank shall have a minimum useable capacity of 65 gallons of fuel with a sufficient additional volume to allow for thermal expansion of the fuel without overflowing the vent.

A mechanical fuel pump shall be provided and sized by the engine manufacturer as part of the engine.

Fuel Re-Prime

An auxiliary 12 volt fuel pump shall be included in the fuel system. The electric pump shall permit re-priming of the fuel lines and engine. The pump may be manually operated with a switch located accessible to driver. The electric pump shall also automatically operate in conjunction with the mechanical fuel pump as long as engine oil pressure is present. The system shall be plumbed to allow full flow to by-pass the pump.

Fuel Shut-Off

A shut-off valve shall be supplied to prevent drain back of fuel into the main supply line during filter changes. The valve(s) shall be located: one (1) at fuel tank, one (1) inlet side of OEM fuel filter.

Fuel Line Hose

Wire braided fuel hose meeting SAE J-1402 shall be provided for the chassis fuel system. The hose shall have a working temperature rating of -55 degree F to 300 degree F.

The ends of the hose shall have connections that shall allow the hose to be reattached if removed.

ALTERNATOR

360 Amp Alternator

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

A Niehoff model C527 360 amp SAE (J56) rated, 320 amp at 200 degrees F at 5000 RPM NFPA 1901 rated brush-less type alternator with rectifier shall be provided. It shall be self-energized and shall have a negative voltage compensating remote solid-state voltage regulator. The alternator shall be installed in accordance with the engine manufacturer's recommendations.

BATTERIES

Battery System

The manufacturer shall supply five (5) heavy duty Group 31 12 volt maintenance-free batteries. Each battery shall be installed and positioned so as to allow easy replacement of any single battery. Each battery shall be equipped with carrying handles to facilitate ease of removal and replacement. There shall be two (2) steel frame-mounted battery boxes, one (1) on the left frame rail and one (1) on the right frame rail. Each battery box shall be secured to the frame rail with Grade 8 hardware. The boxes shall hold two (2) batteries on the left side and three (3) on the right side. The batteries shall have a minimum combined rating of 5,000 (5 x 1000) cold cranking amps (CCA) @ 0 degrees Fahrenheit and 1025 (5 x 205) minutes of reserve capacity for extended operation. The batteries shall have 3/8-16 threaded stud terminals to ensure tight cable connections. The battery stud terminals shall each be treated with concentrated industrial soft-seal after cable installation to promote corrosion prevention. The positive and negative battery stud terminals and the respective cables shall be clearly marked to ensure quick and mistake-proof identification.

Batteries shall be placed on non-corrosive rubber matting and secured with hold-down brackets to prevent movement, vibration, and road shock. The hold-down bracket J-hooks shall be cut to fit and shall have all sharp edges removed. The batteries shall be placed in plastic trays to provide preliminary containment should there be leakage of hazardous battery fluids. There shall be two (2) plastic trays, one (1) for each set of batteries. Each battery tray shall be equipped with a rubber hose to facilitate drainage. The rubber hose shall be routed to drain beneath the battery box. The batteries shall be positioned in well-ventilated areas.

One (1) positive and one (1) negative jumper stud shall be provided below the front driver side of body/pump module.

Batteries shall have a warranty of twelve (12) months that shall commence upon the date of delivery of the apparatus.

CHASSIS OPTIONS

Engine Fan Clutch

The engine shall be equipped with a thermostatically controlled engine cooling fan. The fan shall be belt driven and utilize a clutch to engage when the engine reaches a specified temperature and / or the water pump is engaged (if equipped).

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When disengaged, the fan clutch shall allow for improved performance from optional floor heaters, reduced cab interior noise, increased acceleration and improved fuel economy.

The fan shall be equipped with a fail-safe engagement so that if the clutch fails the fan shall engage to prevent engine overheating.

Drivelines

Drivelines shall have a heavy duty metal tube and shall be equipped with Spicer 1810 series universal joints to allow full-transmitted torque to the axle(s). Drive shafts shall be axially straight, concentric with axis and dynamically balanced.

Front Tow Eyes

Two (2) 3/4" thick heavy duty steel tow eyes shall be securely attached to the chassis frame rails at the front of the apparatus. They shall be mounted down below the bumper / cab.

Rear Tow Eyes

Two (2) heavy duty tow eyes made of 3/4" (0.75") thick steel having 2-1/2" diameter holes shall be mounted below the body at the rear of the vehicle to allow towing (not lifting) of the apparatus without damage. The tow eyes will be welded to the lower end of a 5" steel channel that is bolted at the end of the chassis frame rails. The tow eyes shall be painted chassis black.

Power Take-Off

Power take-off for the automatic transmission shall be a 6 bolt mounted hydraulic shift with a switch located in the cab. Hydraulic shift will allow the PTO to be shifted while the unit is in motion and without having to shut down the water pump.

DEF Tank

A diesel exhaust fluid (DEF) tank with a five (5) gallon capacity shall be provided.

The DEF tank shall include a heater fed by hot water directly from the engine block to prevent the DEF from becoming too cool to operate correctly per EPA requirements. The tank shall include a temperature sensor to control the heater control valve that controls the feed of hot water from the engine to the DEF tank heater.

A sender shall be provided in the DEF tank connected to a level gauge on the cab dash.

The tank shall be located left side below rear of cab.

CAB MODEL

Quest Long Cab

Specification for: BOROUGH OF POINT PLEASANT BEACH I

The vehicle shall be distinguished by an all-welded aluminum and fully enclosed tilt cab. The cab shall be designed exclusively for fire/rescue service and shall be pre-engineered to ensure long life. It shall incorporate an integral welded substructure of high-strength aluminum alloy extrusions that creates an occupant compartment that is essentially a protective perimeter. The end result is a distinctive structure that is aesthetically appealing, functionally durable, and characterized by increased personnel safety.

The cab shall be constructed from 3/16" (0.188") 3003 H14 aluminum alloy plate roof, floor, and outer skins welded to a high-strength 6063-T6 aluminum alloy extruded sub-frame. Wall supports and roof bows are 6061 T6 aluminum alloy. This combination of a high-strength, welded aluminum inner structure surrounded on all sides by load-bearing, welded aluminum outer skins provides a cab that is strong, lightweight, corrosion-resistant, and durable.

The inner structure shall be designed to create an interlocking internal "roll-cage" effect by welding two (2) 3" x 3" x 0.188" wall-thickness 6063-T5 aluminum upright extrusions between the 3" x 3" x 0.375" wall-thickness 6061-T6 roof crossbeam and the 2.25" x 3" x 0.375" wall-thickness 6063-T6 sub-frame structure in the front. An additional two (2) aluminum upright extrusions within the back-of-cab structure shall be welded between the rear roof perimeter extrusion and the sub-frame structure in the rear to complete the interlocking framework. The four (4) upright extrusions -- two (2) in the front and two (2) in the rear -- shall be designed to effectively transmit roof loads downward into the sub-frame structure to help protect the occupant compartment from crushing in a serious accident. All joints shall be electrically seam welded internally using aluminum alloy welding wire.

The sub-frame structure shall be constructed from high-strength 6061-T6 aluminum extrusions welded together to provide a structural base for the cab. It shall include a side-to-side L-shaped brace across the front, with 1" x 1" full-width cross member tubes spaced at critical points between the front and rear of the cab.

The cab floor shall be constructed from 3/16" (0.188") 3003 H14 smooth aluminum plate welded to the sub-frame structure to give the cab additional strength and to help protect the occupants from penetration by road debris and under-ride collision impacts.

The cab roof shall be constructed from 3/16" (0.188") 3003 H14 aluminum treadplate supported by a grid of fore-aft and side-to-side aluminum extrusions to help protect the occupants from penetration by falling debris and downward-projecting objects. Molded fiberglass or other molded fiber-reinforced plastic roof materials are not acceptable.

The cab side roof perimeter shall be constructed from 5 1/2" x 7" 6063-T5 aluminum extrusions with inboard integral drip rails. A cast aluminum front brow shall be welded to the aluminum side roof perimeter extrusions to ensure structural integrity. The rear cab roof shall be connected to the side walls by a 4" x 7" contoured extrusion. The roof perimeter shall be continuously welded to the cab roof plate to ensure a leak-free roof structure.

The cab rear skin shall be constructed from 3/16" (0.188") 3003 H14 aluminum plate to provide added durability. Structural extrusions shall be used to reinforce the rear wall.

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The left-hand and right-hand cab side skins shall be constructed from 3/16" (0.188") 3003 H14 smooth aluminum plate. The skins shall be welded to structural aluminum extrusions at the top, bottom, and sides for additional reinforcement.

The cab front skin shall be constructed from 3/16" (0.188") 3003 H14 smooth aluminum plate. Each front corner shall have an angled extrusion to hold the windshield sides and connect the cab front to the roof. The cab front shall be welded to the sub frame extrusions below the line of the headlights to provide protection against frontal impact.

Cab Exterior

The exterior of the cab shall be 100" wide x 142" long to allow sufficient room in the occupant compartment for up to eight (8) fire fighters. The cab roof shall be approximately 101" above the ground with a flat roof. The back-of-cab to front axle length shall be a minimum of 68".

Front axle fenderette trim shall be polished aluminum for appearance and corrosion resistance. Bolt-in front wheel well liners shall be constructed of 3/16" (0.188") composite material to provide a maintenance-free, damage-resistant surface that helps protect the underside of the cab structure and components from stones and road debris.

The cab exterior in the engine compartment shall be supplied with insulation to reduce noise and minimize heating from engine operating temperatures. A fiberglass material with foil on both sides shall be installed in the engine compartment. The product shall be third party tested to 374 degrees and show no signs of thickness increase. The engine compartment insulation shall be attached and protected by means of a sound sealing silicone coated fiberglass cloth with high temperature properties. The gray material shall endure continuous service limits from minus 90 to 550 degrees and have a breaking strength of 60 in. lbs. The insulation shall meet or exceed DOT standard MVSS 302-1 and V-0 (UI subject 94 Test).

A polished stainless steel air intake grille with an open area of no less than 81% shall be supplied on the front of the cab.

The cab windshield shall be a two-piece replaceable design for lowered cost of repair. The windshield shall be made from 1/4" (0.25") thick curved, laminated safety glass with a 75% light transmittance automotive tint. The front windshield glass area shall be 3,728-sq. in. Forward visibility to the ground for the average (50th percentile) male sitting in the driver seat shall be no more than 10 feet from the front of the cab to ensure good visibility in congested areas. When equipped with front cab corner mounted mirrors, they shall be visible through wiped areas of the windshield.

Windshield Wipers

Two (2) opposed radial style windshield wipers with two (2) separate electric motors shall be provided for positive operation. The wipers shall be tested beyond the minimum SAE requirement to a total of 3.3 million cycles. The wipers shall be a wet-arm type with a one (1) gallon washer fluid reservoir, an intermittent-wipe function, and an integral wash circuit. Wiper arm length shall be approximately 25", and the blade length approximately 32". Each arm shall have a 90 degree sweep for full coverage of the windshield. The wipers shall be synchronized so as to wipe each windshield simultaneously. The controls shall be steering wheel mounted.

Cab Mounts and Cab Tilt System

The cab shall be independently mounted from the body and chassis to isolate the cab structure from stresses caused by chassis twisting and body movements. Mounting points shall consist of two (2) forward-pivoting points, one (1) on each side; two (2) intermediate rubber load-bearing cushions located midway along the length of the cab, one on each side; and two (2) combination rubber shock mounts and cab latches located at the rear of the cab, one (1) on each side.

An electric-over-hydraulic cab tilt system shall be provided for easy access to the engine. It shall consist of two (2) large-diameter, telescoping, hydraulic lift cylinders, one (1) on each side of the cab, with a frame-mounted electric-over-hydraulic pump for cylinder actuation.

Safety flow fuses (velocity fuses) shall be provided in the hydraulic lift cylinders to prevent the raised cab from suddenly dropping in case of a burst hydraulic hose or other hydraulic failure. The safety flow fuses shall operate when the cab is in any position, not just the fully raised position.

The hydraulic pump shall have a manual override system as a backup in the event of an electrical failure. Lift controls shall be located in a compartment to the rear of the cab on the right side of the apparatus. A parking brake interlock shall be provided as a safety feature to prevent the cab from being tilted unless the parking brake is set.

The entire cab shall be tilted through a 42-45 degree arc to allow for easy maintenance of the engine, transmission and engine components. A positive-engagement safety latch shall be provided to lock the cab in the full tilt position to provide additional safety for personnel working under the raised cab.

In the lowered position, the cab shall be locked down by two (2) automatic, spring-loaded cab latches at the rear of the cab. A "cab ajar" indicator light shall be provided on the instrument panel to warn the driver when the cab is not completely locked into the lowered position.

Cab Interior

The interior of the cab shall be of the open design with an ergonomically-designed driver area that provides ready access to all controls as well as a clear view of critical instrumentation.

The engine cover between the driver and the officer shall be a low-rise contoured design to provide sufficient seating and elbow room for the driver and the officer. The engine cover shall blend in smoothly with the interior dash and flooring of the cab. An all-aluminum subframe shall be provided for the engine cover for strength. The overall height of the engine enclosure shall not exceed 28". The engine cover shall not exceed 45" in width at its widest point.

The engine tunnel shall be constructed from aluminum plate and fully welded in as an integral part of the cab structure. For optimized design, the side wall material thickness shall be .25" and the top shall be .188".

The engine cover shall be provided with a lift-up section to provide easy access for checking and adding transmission fluid, power steering fluid, coolant and engine oil without raising the cab.

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Externally, the engine cover is a molded 18 lb/cu.ft (+/-0.5) flexible integral skinned polyurethane foam at a Durometer of 60 (+/- 5.0) per ASTM F1957-99 and with a minimum skin thickness of 0.0625 inches and shall be provided to reduce the transmission noise and heat from the engine. There shall be molded integral arm rests provided for the driver and officer.

All cab floors shall be covered with a black rubber floor mat that provides an aggressive slip-resistant surface in accordance with current NFPA 1901.

A minimum of 57" of floor-to-ceiling height shall be provided in the front seating area of the cab and a minimum of 57" floor-to-ceiling height shall be provided in the rear seating area. A minimum of 37" of seated headroom at the "H" point shall be provided over each fenderwell.

The floor area in front of the front seat pedestals shall be no less than 21.25" side to side by 24.0" front to rear for the driver and no less than 21.25" side to side by 27.0" front to rear for the officer to provide adequate legroom.

The interior of the cab shall be insulated to ensure the sound (dbA) level for the cab interior is within the limits stated in the current edition of NFPA 1901. The insulation shall consist of 2 oz. wadding and 1/4" (0.25") foam padding. The padding board shall be backed with 1/4" (0.25") thick reflective insulation. The backing shall be spun-woven polyester. Interior cab padding shall consist of a rear cab headliner, a rear wall panel, and side panels between the front and rear cab doors.

The vehicle shall use a seven-position tilt and telescopic steering column to accommodate various size operators. An 18" steering wheel with a center horn button shall be provided. The steering wheel shall be supplied with switching for wipers, master warning, air horns and auxiliary engine brake. In addition there shall be three (3) auxiliary switches on that can be programmed to meet department specified functions.

A full-width overhead console shall be mounted to the cab ceiling for placement of switches and electronic components. The console shall be made from a thermoformed, non-metallic material and shall have easily removable mounting plates.

Storage areas, with hinged access doors, shall be provided below the driver and officer seats.

Recessed storage areas shall be provided in the rear face of the cab wheel well risers. Each area shall provide 900 cubic inches of storage space.

The front cab steps shall be a minimum of 8" deep x 29" wide. The first step shall be no more than 21.0" above the ground (with 385 front tires) and exceeds NFPA 1901 standards of 24". The rear cab steps shall be a minimum 8" deep x 24" wide. The steps shall incorporate intermediate steps for easy access to the cab. The steps are to be located inside the door sill, where they are protected against mud, snow, ice, and weather. The step surfaces shall be aluminum diamond plate with a multi-directional, aggressive gripping surface incorporated into the aluminum diamond plate in accordance with current NFPA 1901.

The cab step wells shall be fitted with lights for dark operation. There shall be a total of eight (8) LED lights, two (2) per door opening provided to illuminate the cab step well area. The

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lights shall be installed above the step surface concealed for protection. The lights are to be activated by the cab door ajar circuit.

A black rubber grip handle shall be provided on the interior of each rear door below the window to ensure proper hand holds while entering and exiting the cab. An additional black rubber grip handle shall be provided on the left and right side windshield post for additional handholds.

Cab Doors

Four (4) flush style side-opening cab doors shall be provided. Doors shall be constructed of a 3/16" (0.188") aluminum plate outer material with an aluminum extruded inner framework to provide a structure that is as strong as the side skins.

Front cab door openings shall be approximately 37 1/2" wide x 73 1/2" high, and the rear cab door openings shall be approximately 31" wide x 73 1/2" high. (The rear door opening height will increase when equipped with the vista roof option). The front and rear doors shall open approximately 70 degrees before limit straps begin to engage. Doors can be opened further to approx 90 degrees by pushing against the limit straps.

The doors shall be securely fastened to the door frames with stainless steel piano hinges, with 3/8" (0.375") diameter pins for proper door alignment, long life, and corrosion resistance. Mounting hardware shall be treated with corrosion-resistant material prior to installation. For effective sealing, a continuous extruded rubber gasket shall be provided around the entire perimeter of all doors.

Flush paddle-style door latches shall be provided on the interiors of the doors. The latches shall be designed and installed to protect against accidental or inadvertent opening as required by NFPA 1901.

The front door windows shall provide a minimum viewing area of 751 sq. in. each. The rear door windows shall provide a minimum viewing area of 670 sq. in. each. All windows shall have 75% light transmittance automotive safety tint. Full roll-down windows shall be provided for the front and rear cab doors with worm gear drive cable operation for positive operation and long life. Scissors or gear-and-sector drives are not acceptable.

Interior Lighting

The cab ceiling lights and the step lights shall be wired through individual door switches to provide interior lighting when the battery power is on and any cab door is opened.

Cab Instruments and Controls

An overhead mounted heater and defroster with a minimum capacity of 60,000 Btu/hr and all necessary controls shall be mounted in the cab. The airflow system shall consist of two (2) levels, defrost and cab, and shall have fresh air and defogging capabilities.

Cab instruments and controls shall be located on the cab instrument panel in the dashboard on the driver's side where they are clearly visible and easily reachable. Gauges and emergency

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warning light switches shall be installed in removable panels for ease of service. The following gauges and controls shall be provided:

- Speedometer/Odometer
- Tachometer
- Engine hour meter
- Engine oil pressure gauge with warning light and buzzer
- Engine water temperature gauge with warning light and buzzer
- Two (2) air pressure gauges with a warning light and buzzer (front air and rear air)
- Fuel gauge with low fuel indicator light
- Voltmeter
- Master battery ignition power switch (rocker with integral indicator)
- Starter switch (button)
- Heater and defroster controls with illumination
- Dimmer switch
- Self-canceling turn signal indicators
- Fast idle switch
- Transmission oil temperature gauge
- Air filter restriction indicator
- Pump shift control with green "pump in gear" and "OK to pump" indicator lights (if applicable)
- Parking brake controls with red indicator light on dash
- Electric horn button at center of steering wheel
- Cab ajar warning light on the message center annunciator

Instrument controls and switches shall be identified as to their function by back lit wording adjacent to each switch, or indirect panel lighting adjacent to the controls.

Electrical System

A fast idle system shall be provided and controlled by a cab-mounted switch. The system shall increase engine idle speed to a preset RPM for increased alternator output.

The cab and chassis system shall have accessible electrical distribution areas. All electrical components shall be located such that standard operations shall not interfere with or disrupt vehicle operation. Fast acting fuses shall be used for directional lights, cab heater, battery power, ignition, and other circuits. An access cover shall be provided for maintenance access to the electrical distribution area.

A 6 place, constantly hot, and 6 place ignition switched fuse panel and ground for customer-installed radios and chargers shall be located in the center of the dash.

Radio suppression shall be sufficient to allow radio equipment operation without interference.

All wiring shall be mounted in the chassis frame and protected from impact, abrasion, water, ice, and heat sources. The wiring shall be color-coded and functionally-labeled every 3" on the outer surface of the insulation for ease of identification and maintenance. The wiring harness shall conform to SAE 1127 with GXL/TXL temperature properties. Any wiring connections

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exposed to the outside environment shall be weather-resistant. All harnesses shall be covered in a loom or braid that is rated at 280 degrees F to protect the wiring against heat and abrasion.

Dual rectangular headlights shall be installed on the front of the cab, one (1) on each side, mounted in a bezel. When not equipped with separate daytime running lights (DRLs), the low beam headlights shall activate with the release of the parking brake to provide this function for additional vehicle conspicuity and safety. The headlight switch shall automatically override the DRL for normal low beam/high beam operation. When separate DRLs are installed, the low beam headlights shall be activated when the windshield wipers are activated and the park brake is released.

Battery jumper studs shall be provided to allow jump-starting of the apparatus without having to tilt the cab.

Cab Crashworthiness Requirement

The apparatus cab shall meet and/or exceed relevant load and impact tests required for compliance certification with the following tests:

- 1) Side Impact Dynamic Pre-Load per SAE J2422 (section 5)
- 2) Quasi-static Roof Strength (proof loads) per SAE J2422 (section 6)
- 3) Frontal Impact per SAE J2420

NO EXCEPTIONS.

A copy of a certificate or letter verifying minimum compliance by an independent, licensed, professional engineer shall be provided upon request.

For any or all of the above tests, the cab manufacturer shall provide either photographs or video footage of the procedure upon request.

ISO Compliance

The manufacturer shall ensure that the construction of the apparatus cab shall be in conformance with the established ISO-compliant quality system. All written quality procedures and other procedures referenced within the pages of the manufacturer's Quality Manual, as well as all Work Instructions, Workmanship Standards, and Calibration Administration that directly or indirectly impacts this process shall be strictly adhered to. By virtue of its ISO compliance the manufacturer shall provide an apparatus cab that is built to exacting standards, meets the customer's expectations, and satisfies the customer's requirements.

CAB ROOF TYPE

Raised Roof

The rear portion of the cab roof shall be raised 12". This will provide at least 5' 7" standing room. The front of the vista hood shall be sloped at 45 degrees from the vertical. The slope shall begin slightly in front of the centerline of the front axle to leave room for warning lights and air conditioning in front of the vista. The main roof extrusion shall extend up into the vista to

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

strengthen the roof perimeter. Windows shall be provided on front, side, and rear unless otherwise specified.

The rear door shall have an 85" vertical dimension for improved ingress/egress characteristics. The door shall be equipped with a dual striker bolt system.

CAB BADGE PACKAGE

Logo Package

The apparatus shall have manufacturer logos provided on the cab and body as applicable.

GRILLE

Cab Grille

The air intake grille on the front of the cab shall be constructed of stainless steel mesh and supported by a 0.80" polished stainless steel frame providing no less than 81% open area for excellent cooling performance.

CAB DOOR OPTIONS

Rear Cab Door Position

The cab rear doors shall be moved to the rear of the wheel opening. This door placement facilitates easier entry and egress by reducing the rear facing seat protrusion into the door opening.

Rear door position to the 58" or (medium cab).

Cab Door Front Windows

The front door cab windows shall be electrically controlled. Each window shall have a switch on the door to control operation. The driver door shall have a switch panel to control each door window individually.

Cab Door Rear Windows

The rear cab door windows shall be electrically controlled. Each window shall have a switch on the door to control operation.

Cab Door Panels

The inner door panels shall be made from 14 gauge brushed finish stainless steel for increased durability. The cab door panels shall incorporate an easily removable panel for access to the latching mechanism for maintenance or service.

Cab Door Stainless Steel Trim

Each cab door shall have a stainless steel trim on the trailing edge of the door opening. Rear doors shall have full vertical height trim; front cab doors shall be 50" tall on rear vertical edge above floor level.

Cab Door Reflective Material

Reflective Red/Fluorescent Yellow Green 3M Diamond Grade material striping shall be supplied on each of the cab doors. The stripes shall run from the lower outer corner to the upper inside corner of the panel, forming an "A" shape when viewed from the rear. The material shall meet NFPA 1901 requirements for size (96 square inches) and reflectivity.

Cab Door Locks

Each cab door shall have a manually operated door lock actuated from the interior of each respective door. Exterior of each cab door shall be provided with a keyed lock integrated with the cab door handle.

MIRRORS

Mirrors, Heated

The cab mirrors shall be heated.

Cab Mirrors

Two (2) Ramco model 6001MCR remote controlled polished aluminum mirrors shall be installed. The mirrors shall incorporate a top main section with a manually adjustable convex lower mirror. The adjustment of main sections shall be through dash switches. Location: mounted on front corners of cab.

MISC EXTERIOR CAB OPTIONS

Cab Canopy Window

There shall be a sliding window provided on the driver's side between the front and rear cab doors.

Window dimensions shall be as follows:

- 58" - 80" C/A cab (medium - extended); 26.69"W x 24.5"H horizontally sliding.

Cab Canopy Window

There shall be a sliding window provided on the officer's side between the front and rear cab doors.

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Window dimensions shall be as follows:

- 44" C/A cab (short cab): 16"W x 24.5"H vertically sliding.
- 58" - 80" C/A cab (medium - extended): 26.69"W x 24.5"H horizontally sliding.

Front Mud Flaps

Black linear low density polyethylene (proprietary blend) mud flaps shall be installed on the rear of the cab front wheel wells. The design of the mud flaps shall have corrugated ridges to distribute water evenly.

Handrails

Cab door assist handrails shall consist of two (2) 1.25" diameter x 18" long 6063-T5 anodized aluminum tubes mounted directly behind the driver and officer door openings one each side of the cab. The handrails shall be machine extruded with integral ribbed surfaces to assure a good grip for personnel safety. Handrails shall be installed between chrome end stanchions and shall be positioned at least 2" from the mounting surface to allow a positive grip with a gloved hand.

Handrails

Cab door assist handrails shall consist of two (2) 1.25" diameter x 36" long 6063-T5 anodized aluminum tubes mounted directly behind the driver and officer rear door openings one each side of the cab. The handrails shall be machine extruded with integral ribbed surfaces to assure a good grip for personnel safety. Handrails shall be installed between chrome end stanchions and shall be positioned at least 2" from the mounting surface to allow a positive grip with a gloved hand.

Rear Cab Wall Construction

The rear cab wall shall be constructed using formed 3/16" (.188") aluminum smooth plate interlocking in aluminum extrusions. A rear cab wall overlay constructed of 3/32" (.090") diamond plate shall be provided over the smooth plate.

HVAC

Air Conditioning

An overhead air-conditioner / heater system with a single roof mounted condenser shall be supplied.

The unit shall be mounted to the cab interior headliner in a mid cab position, away from all seating positions. The unit shall provide ten (10) comfort discharge louvers, four (4) to the back area of the cab and six (6) to the front. These louvers will be used for AC and heat air delivery. Two (2) additional large front louvers shall be damper controlled to provide defogging and defrosting capabilities to the front windshield as necessary.

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The unit shall consist of a high output evaporator coil and heater core with one (1) high output dual blower for front air delivery, and two (2) high performance single wheel blowers for rear air delivery.

A serviceable filter shall be installed on the A/C evaporator. The filter shall consist of a steel perimeter frame with a foam filter.

The control panel shall actuate the air-distribution system with air cylinders, which are to be separated from the brake system by an 85-90 psi pressure protection valve. A three-speed blower switch shall control air speed.

The condenser shall be roof mounted and have a minimum capacity of 65,000 BTU's and have dual fans with a built in receiver drier.

Performance Data: (Unit only, no ducting or louvers)

AC BTU: 55,000

Heat BTU: 65,000

CFM : 1300 @ 13.8V (All blowers)

The compressor shall be a ten-cylinder swash plate type Seltec model TM-31HD with a capacity of 19.1 cu.in. per revolution.

The system shall be capable of cooling the interior of the cab from 100 degrees ambient to 75 degrees or less with 50% relative humidity in 30 minutes or less.

Air Conditioning Condenser(s)

The air conditioning condenser(s) mounted on the roof of the cab shall be painted job color.

Heat, Supplemental

A single 40,000 BTU water heater shall be supplied in the front area of the cab. The unit shall heat the lower section of the driver's and officer's footwell.

Dual 23,000 BTU water heaters with diamond plate covers shall be supplied in the rear of the cab to heat the rear cab lower section.

Dual climate control will be achieved via dual switches installed on a front instrument panel. On units with optional multiplex display climate control, the floor heaters shall be controlled through the HVAC screen in the display.

SEATS

Cab Seats

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

All cab seats shall be Bostrom brand.

Seat, Driver

One (1) H. O. Bostrom Sierra EX8/ABTS seat with high back styling shall be provided for the driver's position.

The ABTS (All-Belts-To-Seat) design shall include a bright red 3-point integrated seat belt with an additional 8-12" of additional useable belt webbing for easy access and comfort—increasing seat belt usage amongst firefighters and rescue personnel.

Seat features shall include:

- Power fore/aft with 8" adjustment
- Power height with 2" adjustment
- Power front seat tilt
- Power rear seat tilt
- Power back recline
- Built in lumbar support

Seat, Rear Facing

One (1) Bostrom Tanker 450 ABTS seat with high back SCBA storage shall be provided in the rear facing position over the driver side wheel well.

The ABTS (All-Belts-To-Seat) design shall include a bright red 3-point integrated seat belt with an additional 8-12" of additional useable belt webbing for easy access and comfort—increasing seat belt usage amongst firefighters and rescue personnel.

Seat features shall include:

- Removable "Store-All" side cushions
- Auto-pivot and return headrest to open for improved exit with SCBA
- 12.5" wide SCBA cavity to store leading SCBA brands
- Shoulder strap holder
- Replaceable seat, side and headrest cushions

Seat, Rear Facing

One (1) Bostrom Tanker 450 ABTS seat with high back SCBA storage shall be provided in the rear facing position over the officer side wheel well.

The ABTS (All-Belts-To-Seat) design shall include a bright red 3-point integrated seat belt with an additional 8-12" of additional useable belt webbing for easy access and comfort—increasing seat belt usage amongst firefighters and rescue personnel.

Seat features shall include:

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

- Removable "Store-All" side cushions
- Auto-pivot and return headrest to open for improved exit with SCBA
- 12.5" wide SCBA cavity to store leading SCBA brands
- Shoulder strap holder
- Replaceable seat, side and headrest cushions

Seat, Officer

One (1) Bostrom Tanker 450 ABTS seat with high back SCBA storage shall be provided in the officer position.

The ABTS (All-Belts-To-Seat) design shall include a bright red 3-point integrated seat belt with an additional 8-12" of additional useable belt webbing for easy access and comfort—increasing seat belt usage amongst firefighters and rescue personnel.

Seat features shall include:

- Removable "Store-All" side cushions
- Auto-pivot and return headrest to open for improved exit with SCBA
- 12.5" wide SCBA cavity to store leading SCBA brands
- Shoulder strap holder
- Replaceable seat, side and headrest cushions

Seat, Rear Wall

Two (2) Bostrom SCBA backs and a two (2) person bench style seat with a single bottom cushion shall be mounted on an aluminum seat riser or the rear wall of the cab. Each side of the seat riser shall be angled, providing sufficient legroom when entering and exiting the cab.

Features shall include:

- Removable "Store-All" side cushions.
- Auto-pivot and return headrest to open for improved exit with SCBA.
- 12.5" wide SCBA cavity to store leading SCBA brands.
- Built-in lumbar support.
- Replaceable seat, side and headrest cushions.

All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.

Bostrom SecureAll Locking System

The H.O. Bostrom SecureAll™ SCBA Locking System shall be one bracket model and store all U.S. and international SCBA brands and sizes while in transit or for storage on fire trucks. The bracket shall be easily adjustable; all adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

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The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Firefighters shall simply push the SCBA unit against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The SecureAll™ bracket shall fit in all H.O. Bostrom Tanker SCBA seats including ABTS and non-ABTS seats and all flip-up ABTS and non-ABTS seats. Additional seat depth shall not be required for proper bracket fit; changes to the shroud back shall not be required for proper mounting of the bracket.

The standard release handle shall be integrated into the seat cushion for quick and easy release and shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

The H.O. Bostrom SecureAll™ system meets NFPA 1901 standards and requirements of EN 1846-2.

Location: officer's seat, rear facing driver's side, rear facing officer's side. The bracket(s) shall be located officer's seat, rear facing driver's side, rear facing officer's side.

Bostrom SecureAll Locking System

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The H.O. Bostrom SecureAll™ system meets NFPA 1901 standards and requirements of EN 1846-2.

The bracket(s) shall be located inboard driver's side rear wall, inboard officer's side rear wall.

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Seat Cover Material

All seats shall have Durawear seat cover material.

Seat Fabric Color

All seats shall be gray in color.

Seating Capacity Tag

A tag that is in view of the driver stating seating capacity of six (6) personnel shall be provided.

MISC INTERIOR CAB OPTIONS

Cab Interior Color

Cab instrument panel, overhead console, trim panels, headliner, and door panels shall be gray.

Sun Visors

Padded sun visors shall be provided for the driver and officer matching the interior trim of the cab and shall be flush mounted into the underside of the overhead console.

Adjustable Pedals

The cab shall feature adjustable brake and throttle pedals. The fore and aft pedal positioning shall be controlled by a switch accessible to the driver.

Cab Dash

All surfaces subject to repeated contact and wear -- the driver side, center and officer side dash and lower front kick panels shall be covered with thermoformed, non-metallic, non-fiber trim pieces to provide excellent scuff and abrasion resistance, as well as chemical stain resistance. The thermoformed material shall comply with Federal Motor Vehicle Safety Standard (FMVSS) 302 for flammability of interior materials.

A removable panel shall be provided on top of the center dash to provide easy access to components within.

CAB ELECTRICAL OPTIONS

Cab Swivel Lights

An interior cab light unit shall be mounted in the headliner consisting of two (2) side ball-joint socket spot lamps. Each light shall be individually switched.

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

Cab Dome Lights

A Weldon LED dome light assembly with one (1) white lens and one (1) red lens and plastic housing shall be installed. The white light activates with appropriate cab door and light assembly switch, the red light activates with light assembly mounted switch only.

There shall be two (2) mounted in the front of the cab, one (1) in the driver and one (1) in the officer ceiling.

There shall be two (2) mounted in the rear of the cab, one (1) in the driver side and one (1) in the officer side ceiling.

Clamshell Switch

A heavy duty metal clamshell switch shall be installed on the officer's side of the engine cover to operate the Q2B.

Clamshell Switch

A heavy duty metal clamshell switch shall be installed on the officer's side of the engine cover to operate the electronic siren.

Radio

The unit shall be equipped with an AC Delco model XTA2300 AM/FM stereo CD with weather band. Two (2) 5-1/4" radio speakers and antenna shall be supplied mounted in padding adjacent to driver and officer seats.

Unit shall be suppressed from engine noise to provide clear sound through respective speakers.

Location: center overhead console offset to driver side.

Radio Speakers Additional Pair

An additional pair of radio speakers shall be supplied.

Rear speakers mounted in rear headliner. Speakers shall be 5-1/4" diameter.

Auto-Eject Battery Charger Receptacle

The battery charger receptacle shall be a Kussmaul 20 amp NEMA 5-20 Super Auto-Eject #091-55-20-120 with a cover. The Super Auto-Eject receptacle shall be completely sealed and have an automatic power line disconnect.

The receptacle shall be located outside driver's door next to handrail and the cover color shall be Yellow.

Horn Button Switch

A three (3) position rocker switch shall be installed in the cab accessible to driver and properly labeled to enable operator to activate the OEM traffic horn, air horn or electronic siren from the steering wheel horn button.

DPF Regeneration Override

An override switch shall be provided for the Diesel Particulate Filter (DPF) regeneration. The switch will inhibit the regeneration process until the switch is reset or the engine is shut down and restarted. The switch shall be located within reach of the driver.

English Dominant Gauge Cluster

The cab operational instruments shall be located in the dashboard on the driver side of the cab and shall be clearly visible. The gauges in this panel shall be English dominant and shall be the following:

- Speedometer/Odometer
- Tachometer with integral hour meter
- Engine oil pressure gauge with warning light and buzzer
- Engine water temperature gauge with warning light and buzzer
- Two (2) air pressure gauges with a warning light and buzzer (front air and rear air)
- Fuel gauge
- Voltmeter
- Transmission oil temperature gauge

This panel shall be backlit for increased visibility during day and night time operations.

Radio Speakers Additional Pair

An additional pair of radio speakers shall be supplied.

Rear speakers mounted in rear headliner. Speakers shall be 5-1/4" diameter.

Officer Speedometer

An electronic speedometer shall be mounted on the passenger's side of the cab, mounted on the switch panel.

Headlights

The front of the cab shall have four (4) headlights. The headlights shall be mounted on the front of the cab in the upper position. The headlights shall be day time operational.

Battery Charger/Air Compressor

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A Kussmaul Auto-Charge 1200 battery charger and air compressor with automatic battery charger shall be installed.

The battery charger shall be completely automatic with an output of 0-40 amps @ 12 volts DC and an input current requirement of 10 amps @ 120 volts AC.

A Kussmaul air compressor with automatic battery conditioner model 091-9-1200 shall be installed. The battery conditioner is completely automatic with a 0-40 amp output to maintain the charge in the battery system. The air compressor shall be powered by a 12 volt DC output from the battery charger and has an output of .30 cfm at 80 PSI. A pressure switch senses the system pressure and operates the compressor whenever the pressure in the air brake system drops below a pre-determined level.

Cab 12 Volt (or 24 Volt) Outlet [Qty: 2]

A plug-in type receptacle for hand held spotlights, cell phones, chargers, etc. shall be installed officer side dash. The receptacle shall be wired battery hot.

Antenna Base

There shall be a Tessco P/N 90942 universal antenna base mounted on the cab roof with a weatherproof connector. The antenna base shall be NMO Motorola Style (equivalent to a MATM style). The antenna shall be located officer side forward with coaxial cable terminating at the center of the dash board, officer side rearward with coaxial cable terminating at the center of the dash board, driver side forward with coaxial cable terminating at the center of the overhead console, driver side rearward with coaxial cable terminating at the center of the overhead console.

Battery Charger Location

The battery charger shall be located behind driver's seat.

Air Compressor Location

The air compressor shall be located behind driver's seat.

LED Cab Headlights

JW Speaker LED headlight model 8800 shall be provided. LED lights shall be provided in the low and high beam position of the head lamp assembly.

Cab Turn Signals

A pair of TecNiq LED (Light Emitting Diode) turn signal lights with amber lens shall be installed on the front of the cab. The strip type lights shall be 1.25" high x 15" long and be recess mounted in the quad bezels between the headlights and warning lights.

Interior Lighting

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A courtesy light package shall be provided for the cab interior.

Engine Cover Lighting

Two (2) recessed red LED strip lights shall be provided over the center engine cover area. The lights shall be recessed into the interior trim panel and be located left and right of center. Two (2) switches shall be provided, one (1) on the driver side to activate the driver side lights and one (1) on the officer side to activate the officer side lights.

Wash Lights

Two (2) red LED wash lights shall be provided over the center dash area. The lights shall be recessed into the interior trim panel and be wired to the headlight circuit.

Floor Lighting

Four (4) red LED lights shall be provided to illuminate the cab floor. The lights shall be located in the driver, officer and rear crew areas and be wired through the the door ajar switches.

The floor lights shall also be programmed to operate at low intensity when the marker / headlights are activated.

BODY COMPT LEFT SIDE

Driver Side Assembly

The driver side assembly shall be constructed entirely of aluminum extrusions and interlocking aluminum plates. This aluminum modular design shall provide a high strength-to-weight ratio for increased equipment carrying capacity.

The driver side body corners shall be 6063-T5 extruded aluminum corner sections with a 3/16" (0.188") wall thickness. The side body extrusions shall be 6063-T5 aluminum tubing with a 3/16" (0.188") wall thickness and 3/16" (0.188") outside corner radius. The corners and sides shall be welded both internally and externally at each joint using an aluminum alloy welding wire.

The driver side body shall be completely sanded and deburred to assure a smooth finish and painted job color.

Driver Side Compartments

The three (3) driver side compartments shall be constructed from 3003 H14 1/8" (.125") smooth aluminum plate. The compartments shall be modular in design and shall not be a part of the body support structure.

There shall be one (1) compartment located ahead of the rear wheels. This compartment shall be approximately 36" wide x 68" high x 26" deep in the lower 30" high section and 12" deep in the

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upper 38" high section. The compartment shall contain approximately 25.7 cu. ft. of combined storage space. The door opening shall be approximately 36" wide x 68" high.

There shall be one (1) compartment located over the rear wheel. The compartment shall be approximately 56" wide x 34" high x 12" deep and contain approximately 13.2 cu. ft. of storage space. The door opening shall be approximately 56" wide x 34" high.

There shall be one (1) compartment located behind the rear wheel. The compartment shall be approximately 50" wide x 68" high. The forward area of the compartment shall be 36" wide x 30" high x 26" deep in the lower area and 36" wide x 38" high x 12" deep in the upper area. The enhanced extended rear portion of the compartment shall be approximately 14" wide x 68" high x 25" deep in the lower 30" high section and 10" deep in the upper 38" high section. The total combined storage space shall be approximately 34.8 cu. ft. The lower forward area of this compartment shall be transverse through to the rear compartment(s). The door opening shall be approximately 50" wide x 68" high.

Each compartment seam shall be sealed using a permanent pliable silicone caulk. The walls of each compartment shall be machine-louvered for adequate ventilation.

An externally-mounted compartment top shall be provided and constructed of a 1/8" (.125") aluminum treadplate.

BODY COMPT RIGHT SIDE

Officer Side Assembly

The officer side assembly shall be constructed entirely of aluminum extrusions and interlocking aluminum plates. This aluminum modular design shall provide a high strength-to-weight ratio for increased equipment carrying capacity.

The officer side body corners shall be 6063-T5 extruded aluminum corner sections with a 3/16" (0.188") wall thickness. The side body extrusions shall be 6063-T5 aluminum tubing with a 3/16" (0.188") wall thickness and 3/16" (0.188") outside corner radius. The corners and sides shall be welded both internally and externally at each joint using an aluminum alloy welding wire.

The officer side body shall be completely sanded and deburred to assure a smooth finish and painted job color.

Officer Side Compartments

The three (3) officer side compartments shall be constructed from 3003 H14 1/8" (.125") smooth aluminum plate. The compartments shall be modular in design and shall not be a part of the body support structure.

There shall be one (1) compartment located ahead of the rear wheels. This compartment shall be approximately 36" wide x 68" high x 26" deep in the lower 30" high section and 12" deep in the

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upper 38" high section. The compartment shall contain approximately 25.7 cu. ft. of combined storage space. The door opening shall be approximately 36" wide x 68" high.

There shall be one (1) compartment located over the rear wheel. The compartment shall be approximately 56" wide x 34" high x 12" deep and contain approximately 13.2 cu. ft. of storage space. The door opening shall be approximately 56" wide x 34" high.

There shall be one (1) compartment located behind the rear wheel. The compartment shall be approximately 50" wide x 68" high. The forward area of the compartment shall be 36" wide x 30" high x 26" deep in the lower area and 36" wide x 38" high x 12" deep in the upper area. The enhanced extended rear portion of the compartment shall be approximately 14" wide x 68" high x 25" deep in the lower 30" high section and 10" deep in the upper 38" high section. The total combined storage space shall be approximately 34.8 cu. ft. The lower forward area of this compartment shall be transverse through to the rear compartment(s). The door opening shall be approximately 50" wide x 68" high.

Each compartment seam shall be sealed using a permanent pliable silicone caulk. The walls of each compartment shall be machine-louvered for adequate ventilation.

An externally-mounted compartment top shall be provided and constructed of a 1/8" (.125") aluminum treadplate.

Ladder Rack

A 2-arm overhead ladder rack shall be provided to place the ladders at a safe and convenient height for unloading and loading. The rack shall be located over the body.

The rack shall utilize two (2) hydraulic rotary actuators, one (1) located inside the front compartment and one (1) located inside the rear compartment. The rack shall utilize two (2) lifting arms which are located outside of both the front and rear compartments. The lifting arms shall be made of 6061-T6 aluminum with a wall thickness of 0.60". The rack shall have a main mounting rack for attaching ladders and accessories. The main mounting rack shall be made of 6061-T6 aluminum extrusion with a wall thickness of 0.25" and end plates made of 0.75" thick 6061-T6 aluminum.

The rack shall be electrical/hydraulically operated by a durable high cycle 12 volt actuator and controlled by the multiplex electrical system by means of a control panel. The ladder rack control panel shall include a master on/off switch, a lifting arm raise/lower switch, a power indicator light and an operating instruction plate. The control panel shall be mounted on the pump panel adjacent to the ladder rack of the apparatus to allow the operator to monitor operations and ground personnel while lowering and raising the rack. The assembly shall have appropriate safety labeling.

The rack shall be capable of raising and lowering a maximum of seven hundred (700) pounds of dry load equipment from chest height at ground level to the storage position above the hose bed. The ladder brackets shall use low friction wear pads for protection. The rack shall be easily configurable for mounting various complements of ladders, pike poles, hard suction hoses, etc.

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A visual signal shall be provided to indicate when the ladder rack is not in the stowed position by two (2) amber flashing lights, one (1) on each end of the rack. The rack shall also be wired through the door ajar indicator light located in the cab to alert the driver that the rack is not stowed if the park brake is released. Two (2) safety locks, one (1) for each lifting arm, shall be provided to automatically secure the lifting arms while in the travel/stowed position.

The ladder rack assembly shall meet requirements of NFPA 1901.

BODY COMPT REAR

Rear Body Assembly

The rear body shall be constructed entirely of aluminum extrusions and interlocking aluminum plates and includes a full height center rear compartment.

The rear body frame shall be 6063-T5 1.5" x 4" and 1.5" x 3" aluminum extrusions with a 3/16" (0.188") wall thickness and 3/16" (0.188") outside corner radius and 1/8" (0.125") smooth plate. The rear extrusions shall be welded both internally and externally at each joint using an aluminum alloy welding wire.

Rear Body Compartment

The full height center rear compartment shall be constructed from 3003 H14 1/8" (.125") smooth aluminum plate. The compartment shall be modular in design and shall not be a part of the body support structure.

The compartment shall be approximately 38" wide and shall vary in height and depth dependent upon water tank capacity. The lower area of this compartment shall be transverse through to the side rear compartments.

The compartment seams shall be sealed using a permanent pliable silicone caulk. Machined louvers shall be provided for adequate ventilation.

Rear Upper Compartment Depth

The upper rear compartment depth shall be approximately 25" deep.

Tailboard

Tailboard Step

A tailboard step shall be provided at the rear of the body. The tailboard shall be approx. 15.5" in depth and in accordance with NFPA in both step height and stepping surface. The maximum rear step height to the tailboard shall not exceed 24".

The tailboard step shall be formed from 3/16" (0.188") aluminum treadplate and shall be reinforced with 6063-T5 1.5" x 3" aluminum extrusion. The tailboard shall be in accordance with current NFPA requirements and shall include a multi-directional aggressive gripping

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surface incorporated into the diamond plate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8" (0.125") Gripping surfaces shall be circular in design, a minimum of 1" diameter and on centers not to exceed 4".

The tailboard step shall be bolted on to the body from the underside assuring a clear surface and shall be easily removable for replacement in the case of damage.

Enhanced Extended Compartment Framework

Each side of the tailboard shall be the external compartment frame work of the enhanced extended side compartments. The compartment frame work shall be 6063-T5 1.5"x 4" and 1.5" x 3" aluminum extrusions with a 3/16" (0.188") wall thickness and 3/16" (0.188") outside corner radius. The rear extrusions shall be welded both internally and externally at each joint using an aluminum alloy welding wire.

The compartment frame work shall include two (2) compartment tops. The compartment tops shall be constructed of 3/16" (0.188") aluminum diamond plate. Each compartment top shall include a multi-directional aggressive gripping surface incorporated into the diamond plate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8" (0.125"). Gripping surfaces shall be circular in design, a minimum of 1" diameter and on centers not to exceed 4". The compartment tops shall be bolted on and shall be easily removable for replacement in the case of damage.

Hosebed Access Steps

Heavy-duty folding step shall be provided for access to the officer side enhanced extended compartment top. The step shall be in accordance with NFPA in both step height and stepping surface.

The step shall be located one (1) low on the officer side.

Rear Access Handrails

Handrails shall be provided at the rear of the body to assist ground personnel accessing the tailboard step and hosebed area. Each handrail shall be constructed of 6063T5 1.25" OD anodized aluminum tube, with an integral ribbed surface to assure a good grip for personnel safety, and shall be mounted between chrome stanchions.

One (1) handrail shall be provided (as applicable) on the driver side upper hosebed side. This handrail shall be for use with the driver side hosebed access steps.

Handrails shall be located- two (2) handrails, one (1) on each side, appropriately sized handrail mounted vertical on the trailing edge of the body and appropriately sized handrail(s) mounted horizontal below the rear hosebed opening.

AERIAL BODY OPTIONS

Auxiliary Ground Pads

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Two (2) auxiliary ground pads shall be provided. The pads shall be 24" x 24" x 1/2" thick aluminum plate with a grab handle welded to the top surface of the pad. The pads shall be stored in brackets that are mounted below the body.

50' Boom Body Module

Body Construction

The boom body module shall be constructed entirely of aluminum extrusions with interlocking aluminum plates. A modular aluminum body is required due to the high strength-to-weight ratio of aluminum, its corrosion resistance, its ease of repair, and its light weight for increased equipment carrying capacity.

The interlocking body framework shall be constructed from beveled 6061-T6 and 6063-T5 extrusions electrically seam welded both internally and externally at each joint using 5356 aluminum alloy welding wire.

The body substructure shall be constructed of aluminum extrusions. Body designs that incorporate steel substructures connected to aluminum compartments are not as corrosion-resistant and are not acceptable.

A hinged access door approximately 12" wide x 29" high shall be installed directly ahead of the left side operator's panel. The door shall be constructed from 3/16" (.188") aluminum treadplate. The access door shall include two 92) thumb latches and be vertically hinged to provide access to the aerial electrical panel and hydraulic system overrides.

Body Mounting System

The body shall be attached to the chassis / torque box with four (4) of 5/8" (.625) diameter steel bolts. The aluminum body shall be protected from contact with the steel aerial torque box by 5/16" x 2" (.3125 x 2.0) fiber-reinforced rubber strips to prevent wear and galvanic corrosion caused when two dissimilar metals come in contact. Body designs that weld the body to the aerial torque box or to the chassis frame rails are not acceptable because of the stress imposed on the vehicle during road travel and aerial operations.

Aerial Access Staircase

An aluminum staircase shall be recessed into the front of the apparatus as an integral part of the body. Ladder steps shall be constructed of aluminum tread plate. Access to the top to the boom and to the top of the apparatus body shall be via this ladder.

Compartment Construction

The compartment walls and ceiling shall be constructed from 1/8" (0.125") formed aluminum 3003 H14 alloy plate. The compartment shall be modular in design and shall not be part of the body support structure.

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Compartment floor shall be constructed of 1/8" (0.125") aluminum diamond plate welded in place. Compartment floors shall be supported by 1.5" x 3" x 1/8" (0.125") walled aluminum extrusions. The compartment seams shall be sealed using a permanent pliable silicone caulk. The walls of each compartment shall be machine-louvered for adequate ventilation. External compartment tops shall be constructed of 1/8" (0.125") embossed aluminum diamond plate. Service access shall be provided to the main body wiring harnesses.

The compartment interior walls and ceiling shall be natural finish aluminum to provide a long-lasting, maintenance-free surface.

Boom Module Compartment

There shall be one (1) compartment directly ahead of the right side pump panel. The compartment shall be approximately 36" wide x 33" high x 25" deep (upper) and 24" wide x 34" high x 25" deep (lower). Total storage space for the compartment shall be approximately 29.0 cu. ft. with a 36" wide x 67" high door opening.

Handrails

Access handrails shall be provided at the left side staircase. All body handrails shall be constructed of maintenance-free, corrosion-resistant extruded aluminum. Handrails shall be a minimum of 1.25" diameter and shall be installed between chrome end stanchions at least 2" from the mounting surface to allow for access with a gloved hand. The extruded aluminum shall be ribbed to assure a good grip for personnel safety.

The handrails shall be installed as follows:

- One (1) on each side of the aerial access stair case

Rubrail

The boom module shall have a rubrail along the length of the body on each side. The rubrail shall be constructed of minimum 3/16" thick anodized aluminum 6463T6 extrusion. The rubrail shall be a minimum of 2.75" high x 1.25" deep and shall extend beyond the body width to protect compartment doors and the body side.

The rubrail shall be of a C-channel design to allow marker and warning lights to be recessed inside for protection. The top surface of the rubrail shall have a minimum of five (5) serrations raised .1" high with cross grooves to provide a slip-resistant edge for the rear step and running boards. The rubrail shall be spaced away from the body using 3/16" nylon spacers. The ends of each section shall be provided with a rounded corner piece. The area inside the rubrail C-channel shall be inset with a reflective material for increased side and rear visibility.

Steps, Standing, and Walking Surfaces

The maximum stepping distance shall not exceed 18", with the exception of the ground-to-first step distance, which shall not exceed 24". The maximum ground-to-first step distance shall be maintained when the stabilizers are deployed. All steps or ladders shall sustain a minimum static load of 500 lbs. without deformation as outlined in the current edition of NFPA 1901.

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All exterior steps shall be designed with an average slip resistance of .68 when wet as measured with an English XL tester following ASTM F 1679 (Standard Test Method for Using a Variable Incidence Tribometer).

DOORS

Painted Roll Up Compartment Door

A ROM brand roll up door painted job color shall be provided on a compartment up to 45" tall. The door(s) shall be installed in the following location(s): L2, R2.

The Robinson door slats shall be double wall box frame and manufactured from anodized aluminum. The slats shall have interlocking end shoes on each slat. The slats shall have interlocking joints with a PVC/vinyl inner seal to prevent any metal to metal contact and inhibit moisture and dust penetration.

The track shall be painted aluminum with a finishing flange incorporated to provide a finished look around the perimeter of the door without additional trim or caulking. The track shall have a replaceable side seal to prevent water and dust from entering the compartment.

The doors shall be counterbalanced for ease in operation. A full width latch bar shall be operable with one hand, even with heavy gloves. Securing method shall be a positive latch device.

A magnetic type switch integral to the door shall be supplied for door ajar indication and compartment light activation.

The door opening shall be reduced by 2" in width and approximately 8-9" in height depending on door height.

Roll Up Compartment Door

A ROM brand roll up door with satin finish shall be provided on a compartment greater than 45" tall. The door(s) shall be installed in the following location(s): B1.

The Robinson door slats shall be double wall box frame and manufactured from anodized aluminum. The slats shall have interlocking end shoes on each slat. The slats shall have interlocking joints with a PVC/vinyl inner seal to prevent any metal to metal contact and inhibit moisture and dust penetration.

The track shall be anodized aluminum with a finishing flange incorporated to provide a finished look around the perimeter of the door without additional trim or caulking. The track shall have a replaceable side seal to prevent water and dust from entering the compartment.

The doors shall be counterbalanced for ease in operation. A full width latch bar shall be operable with one hand, even with heavy gloves. Securing method shall be a positive latch device.

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A magnetic type switch integral to the door shall be supplied for door ajar indication and compartment light activation.

The door opening shall be reduced by 2" in width and approximately 8-9" in height depending on door height.

Painted Roll Up Compartment Door

A ROM brand roll up door painted job color shall be provided on a compartment greater than 45" tall. The door(s) shall be installed in the following location(s): L1, L3, R1, R3.

The Robinson door slats shall be double wall box frame and manufactured from anodized aluminum. The slats shall have interlocking end shoes on each slat. The slats shall have interlocking joints with a PVC/vinyl inner seal to prevent any metal to metal contact and inhibit moisture and dust penetration.

The track shall be painted aluminum with a finishing flange incorporated to provide a finished look around the perimeter of the door without additional trim or caulking. The track shall have a replaceable side seal to prevent water and dust from entering the compartment.

The doors shall be counterbalanced for ease in operation. A full width latch bar shall be operable with one hand, even with heavy gloves. Securing method shall be a positive latch device.

A magnetic type switch integral to the door shall be supplied for door ajar indication and compartment light activation.

The door opening shall be reduced by 2" in width and approximately 8-9" in height depending on door height.

Drip Pan

A ROM drip pan shall be supplied for each roll-up door. The drip pan shall be made from a high strength aluminum alloy. The splashguard and end caps shall be made from extruded and injection molded high-impact plastic. Drip pan location(s): L1, L2, L3, R1, R2, R3, B1.

Painted Roll Up Compartment Door

A ROM brand roll up door painted job color shall be provided on a compartment greater than 45" tall. The door(s) shall be installed in the following location(s): officer side boom module compartment.

The Robinson door slats shall be double wall box frame and manufactured from anodized aluminum. The slats shall have interlocking end shoes on each slat. The slats shall have interlocking joints with a PVC/vinyl inner seal to prevent any metal to metal contact and inhibit moisture and dust penetration.

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The track shall be painted aluminum with a finishing flange incorporated to provide a finished look around the perimeter of the door without additional trim or caulking. The track shall have a replaceable side seal to prevent water and dust from entering the compartment.

The doors shall be counterbalanced for ease in operation. A full width latch bar shall be operable with one hand, even with heavy gloves. Securing method shall be a positive latch device.

A magnetic type switch integral to the door shall be supplied for door ajar indication and compartment light activation.

The door opening shall be reduced by 2" in width and approximately 8-9" in height depending on door height.

Drip Pan

A ROM drip pan shall be supplied for each roll-up door. The drip pan shall be made from a high strength aluminum alloy. The splashguard and end caps shall be made from extruded and injection molded high-impact plastic. Drip pan location(s): officer side boom module compartment.

SHELVES

Two (2) Permanent Shelves

There shall be a permanent mounted aluminum shelf provided for compartment L1 at offset (above extrusion if applicable), L3 at offset (above extrusion if applicable). The shelf shall be at the offset within the compartment.

The shelf shall be constructed of 3/16" (.187") smooth aluminum plate. The shelf shall have a minimum 2" front lip for added strength and reinforcement and to accommodate optional plastic interlocking compartment tile systems.

The shelf shall be capable of holding 100 lbs.

TRAYS / TOOLBOARDS

Four (4) Roll-Out Tray

There shall be a floor mounted roll-out tray provided in compartment L3, R1, R3, B1.

The roll-out tray shall be constructed of 3/16" (.187") smooth aluminum plate with a sanded finish and welded corners for increased strength and rigidity. The tray shall be sized in width and depth as applicable.

For greater tray accessibility, the drawer slides shall feature one hundred percent extension. The tray shall utilize a gas spring to secure the tray in the open or closed position.

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The tray shall have a total capacity of 500 lbs.

COVERS

Hose Bed Cover

A cover constructed of Black 18 oz. PVC vinyl coated polyester shall be installed over the apparatus hose bed. The base fabric shall be 1000 x 1300 Denier Polyester with a fabric count of 20 x 20 square inch.

The front edge of the cover shall be mechanically attached to the body. The sides of the cover shall be held in place with heavy duty Velcro strips running the length of the hose bed. The rear of the cover shall have an integral flap that extends down to cover the rear of the hose bed. This flap shall be secured in place with heavy duty nylon straps to comply with the latest edition of NFPA 1901.

Crosslay Cover

A crosslay cover shall be provided for the crosslay storage area of the pump module. The crosslay cover shall be provided in compliance with NFPA 1901.

The crosslay cover shall be constructed from 3/16" (.187") aluminum treadplate. The cover shall include a full-length stainless steel 1/4" (0.25") rod piano-type hinge. The cover shall be hinged to open and not interfere with applicable plumbing components on the apparatus.

The crosslay cover shall include applicable grab handle(s) and two (2) hold downs to secure the cover in the closed position. The cover shall be labeled as a non-stepping surface in non-aerial applications.

Crosslay Cover Hinge

The crosslay cover shall be hinged along the forward edge of the crosslay area.

Crosslay Cover - Sides

A pair of covers constructed of heavy duty black nylon cargo netting shall be installed over the side openings of the apparatus crosslay.

The covers shall be secured in place to comply with the latest edition of NFPA 1901.

Hold Open

Hold open device(s) shall be provided for aluminum crosslay (single or bi-fold) cover.

PUMP MODULE

Pump Module Width

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Pump module shall be 76" wide.

Pump Module

Pump Module Frame

An aluminum extruded pump module shall be provided and located forward of the body. The pump module shall be constructed entirely of aluminum extrusions and interlocking aluminum plates. The pump module design and mounting shall be separate from the body to allow the pump module and body to move independently of each other in order to reduce stress from frame twisting and vibration. The exterior surface of the pump module shall have a sanded finish. The pump module panel opening shall be 45.5" in width.

Pump Module Running Boards

The pump module shall include a running board on each side of the pump module. The running boards shall be in accordance with NFPA in both step height and stepping surface. The maximum step height to each running board shall not exceed 24". The running boards shall be formed from 1/8" aluminum treadplate. Each running board shall include a multi-directional, aggressive gripping surface incorporated into the treadplate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8". Gripping surfaces shall be circular in design, a minimum of 1" diameter and on centers not to exceed 4". Each running board shall be bolted on to the pump module and be easily removable for replacement in the case of damage.

Triple Crosslay Hosebed

Three (3) crosslay hosebeds shall be provided at the front area of the body for preconnected hose. Each of the three (3) crosslay sections shall have a capacity for up to 200' of 2.0" or 150-200' of 2.5" double-jacket fire hose single stacked and preconnected to the pump discharge.

The crosslay floor shall be constructed of 3/16" smooth aluminum plate and shall be slotted to prevent the accumulation of water and allow for ventilation of wet hose. Two (2) 1/4" (.25") smooth aluminum plate non-adjustable dividers with a sanded finish shall be provided to separate the three (3) hose storage areas.

Dunnage Pan

A dunnage pan constructed of 3/16" aluminum treadplate shall be located rearward of the crosslays. The dunnage pan shall be sized to maximize available storage space.

PUMP PANELS

Pump Access Door

The officer side pump module shall include an upper horizontal hinged pump access door.

The door shall be constructed of 3/16" (.187") aluminum treadplate. The compartment door shall be securely attached with a full-length stainless steel piano type hinge with 1/4" pins. The

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hinge shall be "staked" on every other knuckle to prevent the pin from sliding. The door shall include two (2) push-button style latches to secure the door in the closed position and two (2) hold-open devices to hold the door in the open position.

Zolatone Pump Panels

The driver and officer side pump panels shall have a black zolatone painted finish.

MISC PUMP PANEL OPTIONS

Pump Panel Tags

Color coded pump panel labels shall be supplied to be in accordance with NFPA 1901 compliance.

PUMP MODULE OPTIONS

Roller Assemblies

Stainless steel rollers with nylon guides set in aluminum extrusions shall be installed on the preconnect hose storage area(s).

The rollers shall assist with deployment of hose and to protect the module surface.

Flex Joint [Qty: 2]

The area between the pump modules and body shall include a rubber flex joint.

Preconnect Storage Flooring

The preconnect hose storage area(s) shall include removable maintenance-free flooring constructed of 3/4" x 2-3/4" (0.75" x 2.75") hollow aluminum extrusions.

Module Logos

Logos with the OEM brand name shall be provided and shall be mounted one (1) each side on pump module/pre-connect panels. Logos shall be sized as applicable to available space on panel(s).

Air Horn Switch

A heavy duty weatherproof push-button switch shall be installed at the pump operator's panel to operate the air horns.

The switch shall be labeled "Evacuation Alert".

Location: driver side pump panel.

WATER TANK

780 Gallon Water Tank

A 780 gallon (U.S.) "T" booster tank shall be supplied.

The booster tank shall be constructed of polypropylene material. The booster tank shall be completely removable without disturbing or dismounting the apparatus body structure. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal.

The booster tank top, sides, and bottom shall be constructed of a minimum 1/2" (0.50") thick black UV-stabilized copolymer polypropylene. Joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction shall include technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The tank cover shall be constructed of 1/2" thick polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions.

The tank shall have a combination vent and manual fill tower with a hinged lid. The fill tower shall be constructed of 1/2" polypropylene and shall be a typical dimension of 8" x 8" outer perimeter (subject to change for specific design applications). The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall have a 1/4" thick removable polypropylene screen and a polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid.

The booster tank shall have two (2) tank plumbing openings. One (1) for a tank-to-pump suction line with an anti-swirl plate, and one (1) for a tank fill line. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates per the tank fill inlet size.

The sump shall be constructed of a minimum of 1/2" polypropylene. The sump shall have a minimum 3" N.P.T. threaded outlet for a drain plug per NFPA. This shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 3" above the inside floor.

The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength.

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Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with an I.D. of 3" or larger that is designed to run through the tank. This outlet shall direct the draining of overflow water past the rear axle, thus reducing the possibility of freeze-up of these components in cold environments. This drain configuration shall also assure that rear axle tire traction shall not be affected when moving forward.

The booster tank shall undergo extensive testing prior to installation in the truck. All water tanks shall be tested and certified as to capacity on a calibrated and certified tilting scale.

Each tank shall be weighed empty and full to provide precise fluid capacity. Each tank shall be delivered with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight. Engineering estimates for capacity calculations shall not be permitted for capacity certification. The tank must be designed and fabricated by a tank manufacturer that is ISO 9001:2008 certified in each of its locations. The ISO certification must be to the current standard in effect at the time of the design and fabrication of the tank.

A tag shall be installed on the apparatus in a convenient location and contain pertinent information including a QR code readable by commercially available smart phones. The information contained on the tag shall include the capacity of the water and foam (s), the maximum fill and pressure rates, the serial number of the tank, the date of manufacture, the tank manufacturer, and contact information. The QR code will allow the user to connect with the tank manufacturer for additional information and assistance.

The tank shall have a limited Lifetime warranty that provides warranty service for the life of the fire apparatus in which the tank is installed. Warranties are transferable if the apparatus ownership changes by requesting the transfer from the tank manufacturer.

Tank capacity is 780 US gallons / 649 Imperial gallons / 2952 Liters.

Fill Tower Location

Fill tower(s) shall be located offset to officer side of water tank.

TANK PLUMBING

Tank Fill, 2.5 Akron Valve

One (1) 2.5" pump-to-tank fill line having a manually operated 2.5" Akron valve. The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times. The valve shall be controlled with a chrome handle.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Tank Drain, 1.5

One (1) 1-1/2" gated tank drain shall be installed. It shall be controlled by a manually operated Akron 1-1/2" valve at the left side running board area or under L1 compartment with a running board suction tray, slide-out platform, or a heat pan and shall be controlled at the valve and visually indicate the position of the valve at all times.

The valve shall be an Akron 8800HD series with a chrome plated brass ball for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the brass ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Tank to Pump, 3" Akron Valve

One (1) manually operated 3" Akron valve shall be installed between the pump suction and the booster tank in order to pump water from the tank. The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

LADDER STORAGE / RACKS

Hard Suction Racks

Two (2) hard suction hose storage racks shall be provided on the driver side of the body. The racks shall be positioned with one (1) rack located above the other.

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The storage racks shall be constructed of anodized extruded aluminum and include spring-mounted latch handles with stainless steel scuff plates. The scuff plates shall be located on the hose bed side to protect the painted surface.

The storage racks shall be capable of storing one (1) 6" x 10' hard suction hose each.

Ladder Rack Finish

The 2-arm ladder rack shall have a sanded finish.

Pike Pole Storage

Three (3) aluminum tubes shall be mounted on the overhead ladder rack for storing of three (3) pike poles. The tubes shall be mounted on the inboard side of the rack and in such a way that the poles when in the stowed position shall not interfere with hose deployment from the hose bed.

Ladder Storage

Attic Ladder Storage Brackets

Two (2) brackets shall be provided that shall be capable for the storage of one (1) attic ladder. The brackets shall be constructed of high tensile strength aluminum alloy and shall be located inboard side of ladder rack.

Ladder Brand

The ladder brand capable of being carried on the unit shall be Alco-Lite.

Hydraulic Power Supply

Hydraulic Power Supply for E-ONE 2-arm ladder rack. Location: dunnage pan offset to officer side.

Required storage space for hydraulic power supply: 17" wide x 22" long x 12" deep.

Pike Pole

The pike pole(s) capable of being stored shall be the following length: (3) 10' pike poles.

Ladders

The length of ladders capable of being stored shall be the following: 28' 2-section and 16' roof ladder.

Storage Tube Retaining Pin

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The storage tube(s) shall have a secondary retaining pin with cable. This retaining pin shall provide additional securing of the tube contents while the apparatus is in transit and on scene.

HANDRAILS / STEPS

Slide-Out Platform

The slide-out platform shall be approximately 21" deep and shall be constructed of 1/8" aluminum treadplate. The platform shall be mounted under the apparatus body. The platform shall utilize a maintenance-free slide system incorporating stainless steel shoulder bolts that slide in slotted heavy wall aluminum angles. Notches shall be provided at each end of the slots to hold the platform in both the extended and retracted positions.

A chrome grab handle shall be provided on the front face of the platform for ease of operation.

Non-slip aluminum hand rail(s) with chrome plated stanchions shall be provided as best suited for use with the platform operation.

If applicable, NFPA pump throttle height requirement shall be measured from the top of the slide-out platform on all aerials and from the ground on side mounted pump operator panels on non-aerial apparatus.

Location: below driver side pump panel.

Intermediate Pump Panel Step

An intermediate pump panel step shall be provided.

The intermediate step shall be constructed of 3/16" (.187") aluminum treadplate. The step shall include a multi-directional, aggressive gripping surface incorporated into the treadplate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8" (.125"). Gripping surfaces shall be circular in design, a minimum of 1" diameter and on centers not to exceed 4". The step shall be bolted onto the pump module and be easily removable for replacement in the case of damage.

Lighting shall be provided to and positioned illumination of the upper surface of the step.

Hose Bed Folding Steps

Dual lighted LED folding steps shall be positioned to the driver side rear of the body. The steps shall be NFPA compliant for access to the hose bed storage area and in step height and surface area. The steps shall be staggered stepped as applicable with tailboard depth, not applicable with recessed step mounting.

Dual lighted LED folding step with LED lights integral to the step on the top to provide NFPA requirements of 2 FC on the stepping surface. Each step shall also have a LED light integral to the bottom of the step to meet NFPA requirements of a stepping surface up to 18" below the step.

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The folding step shall sustain a minimum static load of 500 lbs. The folding step shall also meet NFPA slip resistance qualifications.

One (1) hand rail shall be installed (as applicable) in compliance with current NFPA. The hand rail shall be constructed of 6063T5 1.25" OD anodized aluminum tube, with an integral ribbed surface to assure a good grip for personnel safety, mounted between chrome stanchions.

Folding Steps [Qty: 2]

Dual lighted LED folding step(s) shall be located officer side front compartment face, driver side front compartment face. The folding step(s) shall meet current NFPA in step height and surface area.

Dual lighted LED folding step with LED lights integral to the step on the top to provide NFPA requirements of 2 FC on the stepping surface. Folding step shall also have a LED light integral to the bottom of the step to meet NFPA requirements of a stepping surface up to 18" below the step. The folding step shall sustain a minimum static load of 500 lbs. The folding step shall also meet NFPA slip resistance qualifications.

One (1) hand rail shall be installed in compliance with current NFPA. The hand rail shall be constructed of 6063T5 1.25" OD anodized aluminum tube, with an integral ribbed surface to assure a good grip for personnel safety, mounted between chrome stanchions.

MISC BODY OPTIONS

Rear Mud Flaps

The rear tires shall have a set of black mud flaps mounted behind the rear chassis wheels with E-ONE logo.

Body Mainframe

The body mainframe shall be entirely constructed of aluminum. The complete framework shall be constructed of 6061T6 and 6063T5 aluminum alloy extrusions welded together using 5356 aluminum alloy welding wire.

The body mainframe shall include 3" x 3" 6061-T6 aluminum 3/8" (0.375") wall crossmember extrusion or 3" x 3" I-beam section aluminum extrusion depending on the application at the front of the body. A solid 3" x 3" "I-beam" section aluminum extrusion shall be provided the full width of the body forward and rearward of the rear wheel well. The crossmembers shall be designed to support the compartment framing and shall be welded to 1-3/16" x 3" (1.188" x 3") solid 6063-T5 aluminum frame sill extrusions. The frame sill extrusions shall be shaped to contour with the chassis frame rails and shall be protected from contact with the chassis frame rails by 5/16" x 2" (0.31" x 2") fiber-reinforced rubber strips to prevent wear and galvanic corrosion caused when dissimilar metals come in contact.

Body Mounting System

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The main body shall be attached to the chassis frame rails with six (6) of 5/8" (0.625") diameter steel U-bolts. The rear of the body shall be spring mounted to allow for chassis flex. This body mounting system shall be used to allow easy removal of the body for major repair or disassembly.

Water Tank Mounting System

The body design shall allow the booster tank to be completely removable without disturbing or dismounting the apparatus body structure. The water tank shall rest on top of a 3" x 3" frame assembly covered with rubber shock pads and corner braces formed from 3/16" angled plate to support the tank. The booster tank mounting system shall utilize a floating design to reduce stress from road travel and vibration. To maintain low vehicle center of gravity the water tank bottom shall be mounted within 5" of the frame rail top.

Hosebed Side Assembly

The hosebed side assemblies shall be made of 3" x 3" slotted aluminum extrusion and 3/16" (.188") smooth plate. The hosebed side assemblies shall provide a 80" high body.

The exterior hosebed side surface shall be completely sanded and deburred to assure a smooth finish and painted job color. The interior hosebed side surface shall be completely sanded and deburred to assure a smooth sanded finish.

Hose Bed Capacity

The hose bed shall have the capacity to store the following hose from the driver side to the officer side. Lay one 400' of 2.5" DJH, Lay two 1000' of 5" LDH and Lay three 400' of 2.5"

Hose Bed Divider [Qty: 2]

There shall be a hose bed divider provided the full fore-aft length of the hose bed.

The hose bed divider shall be constructed of 1/4" (0.25") smooth aluminum plate with an extruded aluminum base welded to the bottom. The rear end of the divider shall have a 3" radius corner to protect personnel. The divider shall be natural finish aluminum for long-lasting appearance and shall be sanded and de-burred to prevent damage to the hose.

The divider shall be adjustable from side to side in the hose bed to accommodate varying hose loads.

Hose Bed Divider Hand Hold

There shall be a hand hole cut-out(s) on the trailing edge of each hose bed divider. The cut-out(s) is specifically sized for use in adjusting of the hose bed divider.

Hosebed

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

The area above the booster tank shall have a hose storage area provided. The hosebed shall be constructed entirely from maintenance-free, 3/4" deep x 7.5" wide, extruded aluminum slats that shall be pop-rieveted into a one-piece grid system. Each slat shall have all sharp edges removed and have an anodized ribbed top surface that shall prevent the accumulation of water and allow for ventilation of wet hose.

The hosebed shall include open areas for the fill tower(s) and boom support. The hosebed design shall incorporate adjustable tracks in the forward area rearward of the fill tower(s) and the rearward area of the hosebed for the installation of an adjustable divider(s). The adjustable tracks shall hold an adjustable divider(s) mounting nut straight, so only a philips head screwdriver is required to adjust a divider(s) from side to side.

A hose deflector constructed of 3/16" (.188) smooth aluminum plate shall be provided forward of the aerial cradle to assist in the deployment of hose around the cradle.

The hosebed shall be easily removable to allow access to the booster tank below.

Overall Height Restriction

The apparatus shall have overall height restrictions. 11' 1"

Note: dimension given for height will be +/- 2.00" for suspension component variances.

Overall Length Restriction

The completed unit shall have an overall length restriction 36' .

Stainless Steel Trim

A stainless steel trim shall be located at the bottom edge of compartment L1, L2, L3, R1, R2, R3 opening. The trim shall provide added protection of the painted surface of the body when equipment is removed from the compartment.

Fuel Fill

A recessed fuel fill shall be provided at the driver side rear wheel well area.

Interior Body Compartment Finish

The body compartment interiors shall have a Zolatone gray finish. Includes inner pan of hinged doors and floors (if smooth plate) and tool compartments (as applicable). Does not include floors if they are diamond plate.

Body Wheel Well

The body wheel well frame shall be constructed from 6063-T5 aluminum extrusion with a slot the full length to permit an internal fit of 1/8" (0.125") aluminum treadplate. The wheel well trim fenderett shall be constructed from 6063-T5 formed aluminum extrusion. The wheel well

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liners shall be constructed of a 3/16" (.187") composite material. The liners shall be bolt-on and shall provide a maintenance-free and damage-resistant surface.

Corner Guards

The forward body corners of the body shall have corner guards installed. The corner guards shall be constructed of (.063") aluminum treadplate.

Corner Guards

The rearward body corners of the body shall have corner guards installed. The corner guards shall be constructed of (.063") aluminum treadplate.

Rubrail

The pump area module(s) and body shall have rubrails mounted along the sides and at the rear.

The rubrail shall be C-channel in design and constructed of 3/16" thick 6463T6 anodized aluminum extrusion. The rubrail shall be 2.75" high x 1.25" deep and shall extend beyond the body width to protect compartment doors and the body side. The rubrail depth shall allow marker and/or warning lights to be recessed inside for protection.

The top surface of the rubrail shall have minimum of five (5) raised serrations. Each serration being a minimum of .1" in height and with cross grooves to provide a slip-resistant edge for the tailboard step and pump module running board areas. The rubrail shall be mounted a minimum of 3/16" off the pump module and body with nylon spacers. The ends of each section shall be provided with a finished rounded corner piece.

Compartment Partitions

Removable partitions shall be provided to separate the two side lower rearward compartments from the lower center rear compartment.

Stainless Steel Trim

A stainless steel trim shall be located at the bottom edge of compartment officer side boom module compartment opening. The trim shall provide added protection of the painted surface of the body when equipment is removed from the compartment.

SCBA BOTTLE STORAGE

Wheel Well SCBA Storage

The body wheel well area shall store up to seven (7) SCBA bottles- four (4) on the officer side and three (3) on the driver side. The bottles shall be secured in each storage area by a vertically hinged door which shall be secured in the closed position by a push button latch. The doors shall match the wheel well area material and finish.

SCBA Strap [Qty: 7]

Straps shall be provided in each wheel well SCBA storage compartment to provide secondary means to hold each SCBA bottle in the compartment. The straps shall be constructed from 1" nylon webbing formed in a loop. The strap(s) shall be mounted to the storage compartment ceiling directly inside the door opening at each bottle location.

PUMPS

Fire Pump System

The pump shall be a midship-mounted Hale QMAX single stage centrifugal pump. The pump shall be mounted on the chassis frame rails of commercial or custom truck chassis and have the capacity of 1,250 to 2,250 gallons per minute (U.S. GPM) NFPA 1901 rated performance, and shall be split-shaft driven from the truck transmission.

The entire pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 psi (207 MPa). All metal moving parts in contact with water shall be of high quality bronze or stainless steel. Pump body shall be horizontally split in two sections, for easy removal of impeller assembly including wear rings and bearings from beneath the pump without disturbing pump mounting or piping.

The pump impeller shall be hard, fine grain bronze of the mixed flow design and shall be individually ground and hand balanced. Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body, and of wrap-around double labyrinth design for maximum efficiency.

The pump shaft shall be heat-treated, corrosion-resistant stainless steel and shall be rigidly supported by three (3) bearings for minimum deflection. The sleeve bearing is to be lubricated by a force fed, automatic oil lubricated design, pressure-balanced to exclude foreign material. The remaining bearings shall be heavy-duty, deep groove ball bearings in the gearbox and shall be splash-lubricated. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of the gearbox.

Two (2) 6" diameter suction ports with 6" NST male threads and removable screens shall be provided, one each side. The ports shall be mounted one (1) on each side of the midship pump and shall extend through the side pump panels. Inlets shall come equipped with long handle chrome caps.

Discharge Manifold

The pump system shall utilize a stainless steel discharge manifold system that allows a direct flow of water to discharge valves. The manifold and fabricated piping systems shall be constructed of a minimum of Schedule 10 stainless steel to reduce corrosion.

The apparatus manufacturer shall provide a full 10 year stainless steel plumbing components warranty. This warranty shall cover defects in materials or workmanship of apparatus

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manufacturer designed foam/water plumbing system stainless steel components for 10 years. A copy of the warranty document shall be provided with the proposal.

Priming System

The electrically-driven priming pump shall be a positive displacement vane type. One (1) priming control, located at the pump operator's position, shall open the priming valve and start the priming motor. The primer shall be oil-less type. The priming valve shall be electronically interlocked to the "Park Brake" circuit to allow priming of the pump before the pump is placed in gear.

Pump Shift

The pump shift shall be pneumatically-controlled using a power shifting cylinder.

The power shift control valve shall be mounted in the cab and be labeled "PUMP SHIFT". The apparatus transmission shift control shall be furnished with a positive lever, preventing accidental shifting of the chassis transmission.

A green indicator light shall be located in the cab and be labeled "PUMP ENGAGED". The light shall not activate until the pump shift has completed its full travel into pump engagement position.

A second green indicator light shall be located in the cab and be labeled "OK TO PUMP". This light shall be energized when both the pump shift has been completed and the chassis automatic transmission has obtained converter lock-up (4th gear lock-up).

Systems

Two (2) test plugs shall be pump panel mounted for third party testing of vacuum and pressures of the pump.

A master drain valve shall be installed and operated from the pump operator's panel. The master pump drain assembly shall consist of a Class 1 bronze master drain with a rubber disc seal and turning handle.

The manual master drain valve shall have six (6) individually-sealed ports that allow quick and simultaneous draining of multiple intake and discharge lines. It shall be constructed of corrosion-resistant material and be capable of operating at a pressure of up to 600 psi.

The master drain shall provide independent ports for low point drainage of the fire pump and auxiliary devices.

Gearbox Cooler

A gearbox cooler shall be provided to maintain safe operating temperatures during prolonged pumping operations for pump rating 1500 GPM and over.

Auxiliary Engine Cooler

An engine cooler used to lower engine water temperature during prolonged pumping operations and controlled at the pump operator's panel shall be provided.

The engine cooler shall be installed in the engine coolant system in such a manner as to allow cool pump water to circulate around engine water, thus forming a true heat exchanger action. Cooler inlet and outlet shall be continuous, preventing intermixing of engine coolant and pump water.

Pump Rating

The fire pump shall be rated at 2000 GPM.

PUMP CERTIFICATION

Pump Certification

The pump, when dry, shall be capable of taking suction and discharging water in accordance with current NFPA 1901. The pump shall be tested at the manufacturer's facility by an independent, third-party testing service. The conditions of the pump test shall be as outlined in current NFPA 1901.

The tests shall include, at a minimum, the pump test, the pumping engine overload test, the pressure control system test, the priming device tests, the vacuum test, and the water tank to pump flow test as outlined in current NFPA 1901.

A piping hydrostatic test shall be performed as outlined in current NFPA 1901.

The pump shall deliver the percentage of rated capacities at pressures indicated below:

- 100% of rated capacity at 150 psi net pump pressure
- 100% of rated capacity at 165 psi net pump pressure
- 70% of rated capacity at 200 psi net pump pressure
- 50% of rated capacity at 250 psi net pump pressure

A test plate, installed at the pump panel, shall provide the rated discharges and pressures together with the speed of the engine as determined by the certification test, and the no-load governed speed of the engine.

A Certificate of Inspection certifying performance of the pump and all related components shall be provided at time of delivery. Additional certification documents shall include, but not limited to, Certificate of Hydrostatic Test, Electrical System Performance Test, Manufacturer's Record of Pumper Construction, and Certificate of Pump Performance from the pump manufacturer.

PUMP OPTIONS

Pump Cooler

The pump shall have a 3/8" line installed from the pump discharge to the booster tank to allow a small amount of water to circulate through the pump casing in order to cool the pump during sustained periods of pump operation when water is not being discharged. The pump cooler line shall be controlled from the pump operator's panel by a 1/4" snubber valve.

Steamers Flush

The pump 6" Steamer/Intake(s) shall be "Flush" mounted with cap installed close as possible/practicable to pump panel. Actual dimension will vary due to pump module width and options selected. The Flush option could result in panel scratching.

Example 72" or 76".

Location: driver's side, officer's side.

Zinc Anodes

The zinc anodes help prevent damage caused by galvanic corrosion within the fire pump. The system provides a sacrificial metal which helps to diminish or prevent pump and pump shaft galvanic corrosion. One anode will be located on the suction side and one will be located on the discharge side of the pump.

Relief Valve System

The pump shall be equipped with a Hale TPM single pressure monitoring and control system that will provide a safety release for excess pressure on the suction and discharge sides of the pump. An internal circulating valve shall be provided to handle small pressure fluctuations while larger surges shall be dumped to the ground. A pressure control valve shall be mounted on the pump panel.

Thermal Relief Valve

A Hale TRVL-120 thermal relief valve shall be provided.

The valve shall help protect the pump by automatically monitoring pump water temperature. The relief valve shall automatically dump a controlled amount of water to the ground when the pump water exceeds the pre-set temperature of the relief valve.

A pump panel mounted indicator shall be installed at the pump operator's panel.

Engine Throttle

Fire Research ThrottleXcel engine throttle and monitoring display shall be installed at the pump operator's panel. The case shall be waterproof and have dimensions not to exceed 6-3/4" high by 4-5/8" wide by 1-3/4" deep. The engine throttle control knob shall be 2" in diameter with a serrated grip, with a red idle push button in the center, and no mechanical stops. Inputs for

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engine information shall be from a J1939 databus, other inputs shall be 12 volts DC or from independent sensors.

The engine RPM shall be set to idle when the pump engaged interlock signal is recognized regardless of the throttle control knob position. Optical technology shall be used to detect the direction and speed that the control knob rotated for RPM control.

The following continuous displays shall be provided:

- Engine RPM; shown with four daylight bright LED digits more than 1/2" high, updated in 10 RPM increments
- Engine oil pressure; shown on an LED bar graph display in 10 psi increments
- Engine coolant temperature; shown on an LED bar graph display in 10 degree increments
- Battery voltage; shown on an LED bar graph display in 0.5 volt increments
- Time and date; shown on a dot matrix message display
- Interlock; OK TO PUMP LED is green to indicate throttle ready

A dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. Operator selections and inputs shall be via push buttons on the front panel.

The program shall store the accumulated operating hours for the pump and engine, previous incident hours, and current incident hours in a non-volatile memory. Stored elapsed hours shall be displayed at the push of a button. The program shall have calibration and self-diagnostic capabilities. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- Low Oil Pressure
- High Engine Coolant Temperature
- High Transmission Temperature
- Low Battery Voltage (Engine Off)
- Low Battery Voltage (Engine Running)
- High Battery Voltage
- High Engine RPM

The engine throttle and monitoring display shall be programmed at installation for a specific engine.

Hale Pump Shift Override

One Hale (1) manual pump shift override shall be side panel mounted to engage the fire pump in the event of an air pressure failure. The pump shift shall be operated by a chrome handled push-pull cable.

Inlet Valve

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A Hale Master Intake Valve (MIV-E) shall be provided for the specified intake. The large diameter inlet valve shall be capable of achieving an NFPA test rating of 1500 GPM through a single 6" suction hose.

The inlet valve shall be operated by a 12 VDC electric motor with a remote switch provided at the pump operator's position. The 12 VDC motor shall be provided with an automatic resetting, thermally-compensated over-current protection circuit breaker to protect the 12 VDC motor and apparatus electrical system. The gear actuator on the valve will cycle from full closed to full open in not less than three (3) seconds. A hand controlled pump panel mounted manual override (knob style) shall be provided.

An indicator light panel shall be located at the pump operator's position to show valve open, closed, or traversing from open to closed.

A built-in adjustable pressure relief valve shall be provided. The pressure relief valve shall be factory set to 125 psi. The pressure relief valve shall provide overpressure protection for the suction hose even when the intake valve is closed.

A 3/4" air bleeder valve shall be provided and controlled at the pump operator's position.

A 1/4" water bleeder shall be supplied and controlled at the pump operator's position.

Location: 5 in. front intake.

Mechanical Pump Seal

The midship pump shall be equipped with a high quality, spring loaded, self-adjusting mechanical seal capable of providing a positive seal to atmosphere under all pumping conditions. This positive seal to atmosphere must be achievable under vacuum conditions up to 26 Hg (draft) or positive suction pressures up to 250 psi.

The mechanical seal assembly shall be 2 inches in diameter and consist of a carbon sealing ring, stainless steel coil spring, Viton rubber boot, and a tungsten carbide seat, with a Teflon back-up seal provided.

Only one mechanical seal shall be required, located on the first stage suction (inboard) side of the pump and be designed to be compatible with a one piece pump shaft (no exceptions). A continuous cooling flow of water from the pump shall be directed through the seal chamber when the pump is in operation.

Master Drain Valve

A manual master drain valve shall be installed on the pump panel. The master pump drain assembly shall consist of a Class 1 bronze master drain with a rubber disc seal. The master drain shall have a rubber seal to prevent water from running out on the running board.

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The manual master drain valve shall have twelve (12) individual-sealed ports that allow quick and simultaneous draining of multiple intake and discharge lines. It shall be constructed of corrosion-resistant material and be capable of operating at a pressure of up to 600 PSI.

The master drain shall provide independent ports for low point drainage of the fire pump and auxiliary devices.

INTAKES

Left Intake 2.5 Akron Valve

One (1) 2-1/2" suction inlet with a manually operated 2-1/2" Akron valve shall be provided on the left side pump panel.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The outlet of the valve shall be connected to the suction side of the pump with the valve body located behind the pump panel. The valve shall come equipped with a brass inlet strainer, 2-1/2" NST female chrome inlet swivel, and shall be equipped with a chrome plated rockerlug plug with a retainer device.

The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance, and decreased friction loss.

A 3/4" bleeder valve assembly will be installed on the left side pump panel.

Right Intake 2.5 Akron Valve

One (1) 2-1/2" gated suction inlet with a manually operated Akron valve shall be installed in the right side pump panel with the valve body behind the panel. The valve control shall be located at the intake and shall visually indicate the position of the valve at all times.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

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The outlet of the valve shall be connected to the suction side of the pump with the valve body located behind the pump panel. The valve shall come equipped with a brass inlet strainer, 2-1/2" NST female chrome inlet swivel and shall be equipped with a chrome plated rockerlug plug with a retainer device.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance, and decreased friction loss.

A 3/4" bleeder valve assembly will be installed on the right side pump panel.

Front Intake 5 w/relief Low S

A 5" stainless steel pipe shall extend from the right suction side of the pump to the front of the apparatus with a low "S" in bumper tray. All fabricated piping used in the front suction shall be constructed of a minimum of Schedule 10 stainless steel pipe to reduce corrosion of the lines. 3/4" valve(s) shall be provided to allow water to be drained.

INTAKE OPTIONS

Adapter 5FNPT x 6MNST Front Intake

The outside end of the front suction shall have a 5" female NPT x 6" male NST chrome plated adapter with suction strainer and 6" long handle chrome cap shall be installed on the front suction piping.

DISCHARGES AND PRECONNECTS

Discharge 2.5 Front Bumper Akron Manual

One (1) 2-1/2" preconnect outlet with a manually operated Akron valve shall be supplied to the extended front bumper. The preconnect shall consist of a 2-1/2" heavy duty hose coming from the pump discharge manifold to a 2-1/2" mechanical swivel hose connection to permit the use of the hose from either side of the apparatus and located above the bumper area located on top of the gravel shield.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The discharge shall be supplied with a 3/4" bleeder valve assembly. The bleeder valve shall be installed to drain water from the gauge pressure line to prevent freezing of the line. The drain shall be controlled with a quarter-turn valve on the pump panel.

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An air blow-out valve shall be installed between the chassis air reservoir and the front jump line. The control shall be installed on the pump operator's panel.

The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Waterway 4 Discharge with 4 Akron Electric

One (1) 4" diameter discharge outlet with an electrically operated Akron valve shall be connected from the pump to the aerial waterway.

The valve shall be an Akron 8840E HD series with a bronze flat ball design for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the brass ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The 9313 Valve Controller from Akron Brass provides reliable and accurate valve control with valve position indication through 10 LED indicators identifying the degree of Open/Close.

The electric valve actuator shall have the following features:

- Technically advanced solid-state electronics
- Protected against EMI
- Programmable Auto Open
- 12 and 24 Volt
- Meets all aspects of NFPA 1901
- 4-1/4" square face
- Easy pump panel mounting
- Retrofits to existing apparatus
- 5 year warranty
- Manual override valve actuation

The valve controls and indicators shall be located at the pump operator's panel.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Front Bumper Discharge Swivel, Brass In Tray

There shall be a brass swivel provided for the front bumper discharge located in hose tray center front bumper centered on lower back wall.

1.5 Single Crosslay Akron Valve [Qty: 2]

One (1) single crosslay discharge shall be provided at the front area of the body. The crosslay shall include one (1) 2" brass swivel with a 1-1/2" hose connection to permit the use of hose from either side of the apparatus.

The crosslay hose bed shall consist of a 2" heavy-duty hose coming from the pump discharge manifold to the 2" swivel. The hose shall be connected to a manually operated 2" Akron valve. The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: crosslay 1 & 2.

Single Crosslay 2.5 Akron Valve

One (1) single crosslay discharge shall be provided at the front area of the body. The crosslay shall have one (1) 2-1/2" mechanical swivel hose connection to permit the use of the hose from either side of the apparatus.

The crosslay hose bed shall consist of a 2-1/2" heavy-duty hose coming from the pump discharge manifold to the 2-1/2" swivel. The hose shall be connected to a manually operated 2-1/2" Akron valve. The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: crosslay 3.

Discharge Left Panel 2.5 Akron Droop

One (1) 2-1/2" discharge outlet with a manually operated Akron valve shall be provided at the left hand side pump panel.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

The discharge shall extend out beyond the pump panel with a 30 degree downward angle with 2-1/2" NST threads to help prevent kinking of the discharge hose. The 30 degree chrome droop shall be an integral part of the discharge valve and shall be equipped with a chrome plated rockerlug cap with a retainer chain.

The discharge shall be supplied with a 3/4" bleeder valve assembly. The bleeder valve shall be installed to drain water from the gauge pressure line to prevent freezing of the line. The drain shall be controlled with a quarter-turn valve on the pump panel.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: left side discharge 1, left side discharge 2.

Discharge Right Panel 2.5 Akron Droop

One (1) 2-1/2" discharge outlet with a manually operated Akron valve shall be provided at the right side pump panel.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

The discharge shall extend out beyond the pump panel with a 30 degree downward angle with chrome plated 2-1/2" NST threads to help prevent kinking of the discharge hose. The 30 degree

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chrome droop shall be an integral part of the discharge valve and shall be equipped with a chrome plated rockerlug cap with a retainer chain.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: right side discharge 2.

Left Rear 2.5" Discharge Akron Valve

One (1) 2-1/2" discharge outlet with a manually operated Akron valve shall be supplied to the left rear of the apparatus by a 2-1/2" stainless steel pipe.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: left rear discharge.

Right Rear 2.5 Discharge Akron Valve

One (1) 2-1/2" discharge outlet with a manually operated Akron valve shall be supplied to the right rear of the apparatus by a 2-1/2" stainless steel pipe.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

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Location: right rear discharge.

Discharge 5 with 4 Akron Electric Valve

One (1) 5" diameter discharge outlet with a 4" electrically operated Akron valve shall be provided at the pump panel.

The valve shall be an Akron 8840E HD series with a bronze flat ball design for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the brass ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The 9313 valve controller from Akron Brass provides reliable and accurate valve control with valve position indication through 10 LED indicators identifying the degree of Open/Close.

The electric valve actuator shall have the following features:

- Technically advanced solid-state electronics
- Protected against EMI
- Programmable Auto Open
- 12 and 24 Volt
- Meets all aspects of NFPA 1901
- 4-1/4" square face
- Easy pump panel mounting
- Retrofits to existing apparatus
- 5 year warranty
- Manual override valve actuation

The valve controls and indicators shall be located at the pump operator's panel.

Location: right side discharge 1.

A 4" to 5" Storz elbow with blind cap and chain shall be provided and installed

DISCHARGE OPTIONS

Controls, Push-Pull T Handle

Control handles for tank supply, tank fill and all discharges shall be Push-Pull "T" style controls. The valve control levers shall be a chrome push-pull locking "T" handle located at the pump operator's panel and shall visibly indicate the position of the valves at all times. The

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control levers shall be located directly adjacent to one another and shall be mounted in line so they are in the same position when shut off. The control lever shall be connected directly to its respective valve by a .718" OD rod to form a direct linkage control system.

Bleeder Drain Valve

A 3/4" bleeder valve shall be provided for the noted discharge(s). The bleeder valve lever shall be stainless steel and shall be a lift style handle for ease of operation. The drain shall be located at the main pump panel.

Bleeder shall be plumbed for use with the: front bumper discharge, left rear discharge, right rear discharge, crosslay preconnect, left discharge, right discharge.

GAUGES

Water Tank Level Gauge

Fire Research TankVision WL2000 water tank volume indicator kit shall be installed. The kit shall include an electronic indicator module, a pressure sensor, and a 12' sensor cable. The indicator shall show the volume of water in the tank on nine (9) easy to see super bright LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of aluminum, and have a distinctive blue label.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, and a data link to connect remote indicators. Low water warnings shall include flashing LEDs at 25%, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.

The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted on the outside of the water tank near the bottom; no probe shall be placed on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.

Hourmeter

A 2" weatherproof hourmeter shall be located on the pump operator's panel.

Fuel Gauge

A 2" weatherproof engine fuel gauge shall be pump panel mounted.

Gauge Pressure 6in 30-0-400 [Qty: 2]

A Class 1 weatherproof 6" compound vacuum pressure gauge with a range of 30-0-400 shall be installed on the pump panel. The gauge shall be filled with a liquid solution.

Gauge, Pressure 3.5" 30-0-400

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A Class 1 weatherproof 3-1/2" compound vacuum pressure gauge with a range of 30-0-400 shall be installed on the pump panel. The gauge shall be filled with a liquid solution.

Gauge shall be provided for the following discharges: front bumper discharge, left rear discharge, right rear discharge, 1.5 in. crosslay preconnect, 2.5 in. crosslay preconnect, waterway discharge, left side discharge 1, left side discharge 2, right side discharge 1, right side discharge 2.

ELECTRICAL SYSTEMS

Multiplex Modem

A modem shall be provided for the multiplex electrical system. The modem shall allow for remote diagnostic and software updates via a telephone line. The modem connection shall be located below the driver's side dash.

Multiplex Electrical System

Electrical System

The apparatus shall incorporate a Weldon V-MUX multiplex 12 volt electrical system. The system shall have the capability of delivering multiple signals via a CAN bus. The electrical system installed by the apparatus manufacturer shall conform to current SAE standards, the latest FMVSS standards, and the requirements of the applicable NFPA 1901 standards.

The electrical system shall be pre-wired for optional computer modem accessibility to allow service personnel to easily plug in a modem to allow remote diagnostics.

The electrical circuits shall be provided with low voltage over-current protective devices. Such devices shall be accessible and located in required terminal connection locations or weather-resistant enclosures. The over-current protection shall be suitable for electrical equipment and shall be automatic reset type and meet SAE standards. All electrical equipment, switches, relays, terminals, and connectors shall have a direct current rating of 125 percent of maximum current for which the circuit is protected. The system shall have electro-magnetic interference suppression provided as required in applicable SAE standards.

Any electrical junction or terminal boxes shall be weather-resistant and located away from water spray conditions.

Multiplex System

For superior system integrity, the networked multiplex system shall meet the following minimum component requirements:

- The network system must be Peer to Peer technology based on RS485 protocol. No one module shall hold the programming for other modules. One or two modules on a network referred to as Peer to Peer, while the rest of the network consists of a one master and several slaves is not considered Peer to Peer for this application.

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

- Modules shall be IP67 rated to handle the extreme operating environment found in the fire service industry.
- All modules shall be solid state circuitry utilizing MOS-FET technology and utilize Deutsch series input/output connectors.
- Each module that controls a device shall hold its own configuration program.
- Each module should be able to function as a standalone module. No "add-on" module will be acceptable to achieve this form of operation.
- Load shedding power management (8 levels).
- Switch input capability for chassis functions.
- Responsible for lighting device activation.
- Self-contained diagnostic indicators.
- Wire harness needed to interface electrical devices with multiplex modules.
- The grounds from each device should return to main ground trunk in each sub harness by the use of ultrasonic splices.

Wiring

All harnessing, wiring and connectors shall be manufactured to the following standards/guidelines. No exceptions.

- NFPA 1901-Standard for Automotive Fire Apparatus
- SAE J1127 and J1127
- IPC/WHMA-A-620 – Requirements and Acceptance for Cable and Wire Harness Assemblies. (Class 3 -- High Performance Electronic Products)

All wiring shall be copper or copper alloys of a gauge rated to carry 125% of the maximum current for which the circuit is protected. Insulated wire and cable 8 gauge and smaller shall be SXL, GXL, or TXL per SAE J1128. Conductors 6 gauge and larger shall be SXL or SGT per SAE J1127.

All wiring shall be color coded and imprinted with the circuit's function. Minimum height of imprinted characters shall not be less than .082" plus or minus .01". The imprinted characters shall repeat at a distance not greater than 3".

A coil of wire shall be provided behind electrical appliances to allow them to be pulled away from mounting area for inspection and service work.

Wiring Protection

The overall covering of the conductors shall be loom or braid.

Braid style wiring covers shall be constructed using a woven PVC-coated nylon multifilament braiding yarn. The yarn shall have a diameter of no less than .04" and a tensile strength of 22 lbs. The yarn shall have a service temperature rating of -65 F to 194 F. The braid shall consist of 24 strands of yarn with 21 black and 3 yellow. The yellow shall be oriented the same and be next to each other.

Wiring loom shall be flame retardant black nylon. The loom shall have a service temperature of -40 F to 300 F and be secured to the wire bundle with adhesive-backed vinyl tape.

Wiring Connectors

All connectors shall be Deutsch series unless a different series of connector is needed to mate to a supplier's component. The connectors and terminals shall be assembled per the connector/terminal manufacturer's specification. Crimble/Solderless terminals shall be acceptable. Heat shrink style shall be utilized unless used within the confines of the cab.

NFPA Required Testing of Electrical System

The apparatus shall be electrical tested upon completion of the vehicle and prior to delivery. The electrical testing, certifications, and test results shall be submitted with delivery documentation per requirements of NFPA 1901. The following minimum testing shall be completed by the apparatus manufacturer:

1. Reserve capacity test:

The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged. The engine shall be shut off and the minimum continuous electrical load shall be activated for ten (10) minutes. All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a test fail.

2. Alternator performance test at idle:

The minimum continuous electrical load shall be activated with the engine running at idle speed. The engine temperature shall be stabilized at normal operating temperature. The battery system shall be tested to detect the presence of battery discharge current. The detection of battery discharge current shall be considered a test failure.

3. Alternator performance test at full load:

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed. The test duration shall be a minimum of two (2) hours. Activation of the load management system shall be permitted during this test. However, an alarm sounded by excessive battery discharge, as detected by the system required in NFPA 1901 Standard, or a system voltage of less than 11.7 volts DC for a 12 volt nominal system, for more than 120 seconds, shall be considered a test failure.

4. Low voltage alarm test:

Following the completion of the above tests, the engine shall be shut off. The total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm activates. The battery voltage shall be measured at the battery terminals. With the load still applied, a reading of less than 11.7 volts DC for a 12 volt nominal system shall be considered a test failure. The battery system shall then be able to restart the engine. Failure to restart the engine shall be considered a test failure.

NFPA Required Documentation

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

The following documentation shall be provided on delivery of the apparatus:

- A. Documentation of the electrical system performance tests required above.
- B. A written load analysis, including:
 - a. The nameplate rating of the alternator.
 - b. The alternator rating under the conditions.
 - c. Each specified component load.
 - d. Individual intermittent loads.

Vehicle Data Recorder

A vehicle data recorder system shall be provided to comply with NFPA 1901, 2009 edition. The following data shall be monitored:

- Vehicle speed MPH
- Acceleration (from speedometer) MPH/Sec.
- Deceleration (from speedometer) MPH/Sec.
- Engine speed RPM
- Engine throttle position % of full throttle
- ABS Event On/Off
- Seat occupied status Occupied Yes/No by position
- Seat belt status Buckled Yes/No by position
- Master Optical Warning Device Switch On/Off
- Time: 24 hour time
- Date: Year/Month/Day

Occupant Detection System

There shall be a visual and audible warning system installed in the cab that indicates the occupant buckle status of all cab seating positions that are designed to be occupied during vehicle movement.

The audible warning shall activate when the vehicle's park brake is released and a seat position is not in a valid state. A valid state is defined as a seat that is unoccupied and the seat belt is unbuckled, or one that has the seat belt buckled after the seat has been occupied.

The visual warning shall consist of a graphical representation of each cab seat in the multiplex display screen that will continuously indicate the validity of each seat position.

The system shall include a seat sensor and safety belt latch switch for each cab seating position, audible alarm and braided wiring harness.

HVAC Controls

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

The air conditioning and heating systems of the apparatus chassis cab shall be controlled through the multiplex electrical system's color display(s). The system shall have the capability to provide automatic climate control.

Multiplex Display

The V-MUX multiplex electrical system shall include a Vista IV touch screen color display.

The display shall have the following features:

- Aspect ratio of 16:9 (Wide Screen)
- Diagonal measurement of no less than 7"
- Touch screen design with "virtual" switch capability
- Master warning switch
- Engine high idle switch
- Five (5) tactal switches to access secondary menus
- Eight (8) multi-function programmable tactal switches
- Specific door ajar indication
- Real time clock
- Provides access to the multiplex system diagnostics
- Video capability for optional back-up camera(s) and GPS display

The display shall be located driver's side engine cover.

Wireless Maintenance System Transmitter

A digital technician maintenance system shall be installed on the vehicle. The system shall capture critical maintenance data and automatically send it to a wireless receiver located on the station's computer. The system shall be capable of automatically notifying mission critical issues.

The system shall provide easy access to critical vehicle maintenance information including:

- Engine hours
- Mileage
- Fuel used
- Fuel level
- Oil pressure
- High oil pressure
- Oil temperature
- High oil temperature
- Voltage
- Coolant temperature
- Tire pressure (with optional sensors)

Wireless Maintenance System Receiver

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

A wireless receiver shall be supplied (shipped loose) for use with the apparatus mounted maintenance system transmitter. The receiver shall be for the end user's connection to the station's computer to collect data from the transmitter. The data captured shall be capable of being sent over the Internet from the station's computer to a central maintenance center. The range capability shall be approximately 300 feet and capable of collecting data from up to 1000 transmitters.

Global Positioning System

A Weldon Global Positioning System (GPS) shall be provided in the cab. The GPS shall be integrated into the vehicle electrical system utilizing the multiplex electrical system color display(s). An antenna shall be installed for optimal satellite reception. The system shall include an SD card slot to load future software updates.

When equipped with driver and officer display, the GPS shall be accessible and controllable by both displays.

LIGHT BARS

Light Bar

A Whelen Freedom series 82" all LED light bar shall be installed. The light bar shall consist of fourteen (14) red LED modules and two (2) LR11 takedown lights with MKEZ7 mounts. Four (4) corner mounted LED modules and ten (10) forward facing LED modules with takedown lights centered.

Lens color: Clear

The lightbar(s) shall be installed in the following location: Centered on the front cab roof

Light Bars

A pair of Whelen 24" Mini-Freedom LED light bars model FT8RRRRF with MK8H high mounts shall be provided. The light bars shall have clear domes with red LEDs.

The clear LEDs (if applicable) shall be switched off in blocking right of way mode.

The light bars shall be installed in the following location: each side over front cab doors.

WARNING LIGHT PACKAGES

Lower Level Warning Light Package

Eight (8) Whelen M6R Super LED red light heads and two (2) Whelen M2R Super LED red light heads shall be provided.

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The lights shall include chrome flanges where applicable. The lights shall be wired with weatherproof connectors and shall be mounted as close to the corner points of the apparatus as is practical as follows:

- Two (2) Whelen M6R Super LED Red lights on the front of the apparatus facing forward
- Two (2) Whelen M6R Super LED Red lights on the rear of the apparatus facing rearward
- Two (2) lights each side of the apparatus, one (1) Whelen M6R Super LED Red each side at the forward most point (as practical), and one (1) Whelen M2R Super LED Red each side at the rearward most point (as practical).
- One (1) Whelen M6R Super LED Red light each side of the apparatus centrally located to provide mid ship warning light.

The side facing lights shall be located at forward most position, centered in rear wheel well, and side facing at rear of body in rubrail if equipped.

All warning devices shall be surface mounted in compliance with NFPA standards.

WARNING LIGHTS

Hazard (Door Ajar) Light

There shall be a 2" red LED hazard light installed as specified.

The light shall be located center overhead.

Upper Rear Warning Lights

A pair of Whelen Ultra Freedom Micro Edge LED lights (model MCFLED25) shall be provided. The lights shall have clear lenses and contain two (2) rear corner mounted red LED modules.

The lights shall be located rear upper body on aerial style brackets to meet upper Zone C requirements.

Warning Lights

Two (2) Whelen 500 series TIR6 Super LED light heads with red lens shall be provided. The rectangular lights shall include model 5TSMAC chrome flanges where applicable.

Location: (1) each side in pump module rubrail if equipped.

Warning Lights

Two (2) Whelen M6 series Linear Super LED red light heads with red lens shall be provided. The rectangular lights shall include chrome flanges where applicable.

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Location: (1) each side in front quad inboard of NFPA warning light, (1) each side above tail lights.

SIRENS

Electronic Siren

A full featured 200 watt electric siren shall be supplied. The siren shall have dual control heads so the driver and officer can conveniently access complete siren control including power up. The control heads shall communicate to the siren amplifier utilizing serial communication protocol over standard Ethernet cables. Each siren control head shall be 9" x 2-1/4" and integrated into the chassis control panels. The solid state unit shall be capable of driving a single high power speaker up to 200 watts to achieve a sound output level that meets Class "A" requirements. The switch display panels shall be back lit and labeled for easy identification. Operating modes shall include Hi-Lo, yelp, wail, and air horn sounds.

A remote microphone control panel shall be supplied. The remote panel shall have a noise cancelling microphone and volume control knob.

Mechanical Siren

A chrome plated and pedestal mounted Federal Q2B-P coaster siren shall be installed on top of the front bumper extension. An electric siren brake switch shall be located in the cab accessible to the driver.

The siren shall be located driver side front bumper.

Electronic Siren Microphone Location

The remote panel for the electronic siren microphone shall be located in the center overhead.

SPEAKERS

Speaker

One (1) Federal model BP-200EF 200 watt speaker shall be recessed behind the front bumper. The speaker shall meet NFPA requirements for sound output producing a minimum 120 dB of sound at 10 feet. A polished stainless steel E-ONE grille shall be installed on the outside of the bumper to prevent road debris from entering the speaker.

Speaker dimensions shall be 7.72 inches high, 7.72 inches wide and 7.8 inches deep with a weight of 20.5 pounds.

The speaker shall be located driver side front bumper.

DOT LIGHTING

License Plate Light

One (1) Truck-Lite model 15905 white LED license plate light mounted in a Truck-Lite model 15732 chrome plated plastic license plate housing shall be mounted at the rear of the body.

LED Marker Lights

LED clearance/marker lights shall be installed as specified.

Upper Cab:

- Five (5) amber LED clearance lights on the cab roof.

Lower Cab:

- One (1) amber LED side turn/marker each side of cab ahead of the front door hinge.

Upper Body:

- One (1) red Trucklite LED clearance light each side, rear of body to the side.

Lower Body:

- Three (3) red Trucklite LED clearance lights centered at rear, recessed in the rubrail.
- One (1) red Trucklite LED clearance light each side at the trailing edge of the apparatus body, recessed in the rubrail.
- One (1) amber Trucklite LED clearance/auxiliary turn light each side front of body/module, recessed in the rubrail.

Marker Lights

One (1) pair of Britax model L427.203L.12V LED amber/red marker rubber housed lights shall be provided. The lights shall be located on the rear body corners mounted in the down angle position. The red lenses shall illuminate to the rear of the apparatus and the amber shall illuminate to the front of the apparatus. The lights shall be wired to the marker light circuit.

Tail Lights

Three (3) Whelen model M6 series LED (Light Emitting Diode) lights shall be installed in a four (4) light vertical housing each side at rear and wired with weatherproof connectors.

Light functions shall be as follows:

- LED red running light with red brake light in upper position.
- LED amber populated arrow pattern turn signal in middle position.
- LED clear back-up light in lower position.

A one-piece chrome plastic housing shall be mounted around the three (3) individual lights in a vertical position. The lower space will be used by the M6 or equivalent lower NFPA warning light.

License Plate Bracket

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There shall be bracket fabricated from aluminum diamond plate, secured to rear of the body to accommodate a license plate.

Turn Signals

A pair of Weldon model 9186-8580-29 bubble style LED amber auxiliary turn signals with stainless steel bezels shall be installed.

Location: (1) each side of cab centered over wheel well.

LIGHTS - COMPARTMENT, STEP & GROUND

Compartment Light Package

Two (2) ROM V4 compartment light strips shall be mounted in each body compartment greater than 4 cu. ft. Transverse compartments shall have four (4) lights located two (2) each side.

Each light bar shall include sixteen (16) super bright white LEDs per foot mounted to circuit boards that have acrylic conformal coating for corrosion protection. The LED circuit boards shall be mounted to an extruded aluminum base with lexan lens. The light shall produce 250 lumens per foot and be waterproof up to 1 meter (3.3 feet).

Compartment lights shall be wired to a master on/off rocker switch on the cab switch panel.

The wiring connection for the compartment lights shall be made with a weather-resistant plug in style connector. A single water and corrosion-resistant switch with a polycarbonate actuator and sealed contacts shall control each compartment light. The switch shall allow the light to illuminate if the compartment door is open.

Ground Lights

The apparatus shall be equipped with a sufficient quantity of lights to properly illuminate the ground areas around the apparatus in accordance with current NFPA requirements. The lights shall be 4" circular LED (Light Emitting Diode) with clear lenses mounted in a resilient shock absorbent mount for improved bulb life. The wiring connections shall be made with a weather resistant plug in style connector.

Ground area lights shall be switched from the cab dash with the work light switch.

One (1) ground light shall be supplied under each side of the front bumper extension if equipped.

Lights in areas under the driver and crew area exits shall be activated automatically when the exit doors are opened.

LIGHTS - DECK AND SCENE

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Hose Bed Light Wired to Back-Up Lights

The hose bed light shall be activated when the chassis is placed in reverse to provide additional lighting, in addition to the back-up lights, when backing the vehicle.

Cab Scene Light Switching

The cab scene lights shall be wired to activate through the appropriate side cab door ajar switch. This application allows the cab scene lights to be used as additional illumination of the ground area for personnel entering or exiting the vehicle. The switching for this application is in addition to the standard cab scene light switching.

Scene Lights

Two (2) Whelen model M6ZC series Linear Super LED clear scene lights shall be provided.

Each shall have Linear Super LED diodes with internal light deflecting optics. The internal light deflecting optics shall redirect the light without the use of angle brackets.

The lights shall be located (1) each side rear compartment face up high, (1) each side of cab, rearward of forward doors, up high and be controlled by a switch in cab accessible to driver (lights on sides of apparatus to be switched separately).

Crosslay Light

A Whelen LED light model PFBP12C shall be installed at the rear area of the crosslay to provide crosslay lighting per current NFPA 1901. The crosslay light shall be switched with work light switch in the cab.

Hose Bed Light

A Whelen LED light model PFBP12C shall be installed at the front area of the hose bed to provide hose bed lighting per current NFPA 1901. The hose bed light shall be switched with work light switch in the cab.

LIGHTS - NON-WARNING

Engine Compartment Light

There shall be LED lighting provided in compliance with NFPA to illuminate the engine compartment area.

Light Wiring

Forward pump panel light at the pump operator's panel shall be wired to the pump shift to provide pump panel illumination when the pump is placed into gear. Top mount application

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center light at the pump operator's panel shall be wired to the pump shift to provide pump panel illumination when the pump is placed into gear.

Pump Compartment Light

An incandescent light shall be provided in the pump compartment area for NFPA compliance. The light shall be wired to operate with the work light switch in the cab.

LED Pump Panel Light Package

Three (3) Weldon model 2631-0000-30 LED lights shall be mounted under a light shield directly above each side pump panel. The work light switch in the cab shall activate the lights when the park brake is set.

Map Light

A Federal "Littlite" LED map light model LF18-LED shall be supplied. The map light shall be 12 volt with 18" flexible gooseneck and a matte black finish. The light shall have a switch provided for white or red illumination. It shall be located at officer's A post.

Hydrant Light

One (1) Whelen 600 blue Super Led shall be provided on the driver side rear compartment face. A switch shall be provided for the light on the driver side pump panel labeled "Hydrant".

Hand Held Spotlight

A Whelen PAR46 hand held 12 volt super LED spotlight with mounting bracket shall be provided. It shall be located at the officer's side of the cab dash with a plug in connector.

CONTROLS / SWITCHES

Additional Switch

A 12 volt switch shall be provided.

The switch shall be located pump operator's panel for pump panel lights.

Three Way Switching

An additional momentary switch with circuitry shall be provided to allow on/off operation of specified device from remote locations. The remote switch shall be mounted pump operator's panel for generator control.

Additional Switch

A 12 volt switch shall be provided.

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The switch shall be located officer's side switch panel for Q2B brake.

Three Way Switching [Qty: 2]

An additional momentary switch with circuitry shall be provided to allow on/off operation of specified device from remote locations. The remote switch shall be mounted officer's side switch panel for cab scene lights.

CAMERAS / INTERCOM

Two-Way Intercom

A two-way Atkinson Dynamics (Federal Signal) intercom system shall be installed to provide communications between the turntable control station and the aerial tip. The system shall consist of a 12 volt transistorized amplifier and two (2) waterproof speaker / microphones.

In addition to the combination speaker / microphone, the turntable shall include a volume control and a push to talk button. The speaker / microphone at the tip shall be hands free operation.

Intercom System

A Sigtronics intercom system shall be provided with six (6) jacks in the cab and one (1) jack on the pump panel.

One (1) Model US-67S ultrasound voice activated intercom system shall be provided in the cab. One (1) Model SE-8S helmet compatible slotted head set shall be provided for the driver position, one (1) Model SE-8 helmet compatible head set shall be provide for the officer position and one (1) Model SE-8 helmet compatible head set shall be provided for four (4) additional seating locations. Interior headset plug-in modules and hanger hooks shall be provided for each of the headset locations. Driver and officer plug-in locations shall be provided with a push to talk module.

One (1) 800121 exterior headset plug-in module and one (1) 800122 push to talk module shall be provided on the pump panel.

MISC ELECTRICAL

Back-Up Alarm

An electronic back-up alarm shall be supplied. The 97 dB alarm shall be wired into the chassis back-up lights to signal when the vehicle is in reverse gear.

12 Volt DC Power Distribution Module

There shall be a 12 place 12 volt DC power distribution module installed as specified.

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The module will have six (6) circuits wired directly to the battery and have six (6) circuits wired through the master battery switch with 12 positions for grounds. Connection to the power module circuit will be through a .250 female spade connector. Each buss will be protected with a 50 amp circuit breaker for overload protection. The module will accept ATC blade type fuses or 22X series circuit breakers.

The module shall be located behind officer's seat.

GENERATOR

Hydraulic Generator

A Smart Power model HR-110 top mount style 10000 watt hydraulic generator shall be provided. The generator shall be installed dunnage pan offset to driver side.

The unit shall come equipped with: modular generator unit (which includes the hydraulic motor and filter, generator, and cooler), axial piston hydraulic pump, hydraulic reservoir, and a gauge panel.

The gauge panel shall display voltage, hour meter, frequency, and amperage.

The hydraulic motor, generator, blower, cooler, and necessary hydraulic components shall be mounted in a rugged steel case.

The modular generator unit shall be 32" long x 13.50" wide x 17.00" high and weigh approximately 240 pounds.

The hydraulic pump shall be driven by a chassis transmission mounted power take off (PTO).

A generator control / PTO engage switch shall be mounted on the cab instrument panel to engage the PTO and start the generator.

Ratings and Capacity

Rating:	10000 watts continuous 12000 watts peak
Volts:	120/240 volts
Phase:	Single, 4 wire
Frequency:	60 Hz
Amperage:	83 amps @ 120 volts or 42 amps @ 240 volts
Engine speed at engagement:	Recommend below 1000 RPM
Operation range:	800 to 2100 RPM

Testing

The generator shall be tested in accordance with current NFPA 1901 standards.

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Notes:

*All ratings and capacities shall be derived utilizing current NFPA 1901 test parameters.

*Extreme ambient temperatures could affect generator performance.

GENERATOR TEST

3rd Party Generator Testing

The generator shall be tested at the manufacturer's facility by an independent, third-party testing service. The conditions and testing of the generator shall be as outlined in current NFPA 1901.

The test shall include operating the generator for two hours at 100% of the rated load. Power source voltage, amps, frequency shall be monitored. The prime mover's oil pressure, water temperature, transmission temperature (if applicable) and power source hydraulic fluid temperature (if applicable) shall be monitored during testing.

The results of the test shall be recorded and provided with delivery documentation.

BREAKER BOXES

Circuit Breaker Panel

A twelve (12) place breaker box with up to twelve (12) appropriately sized ground-fault interrupter circuit breakers shall be supplied. The breaker box will include a master breaker sized according to the generator output. The breaker box will be located in the specified compartment, not to exceed 12' run of wire.

Note: If generator is 5.5KW or less, the main breaker will occupy 2 places, leaving 10 available.

Dimensions: 17.92" high x 14.25" wide x 3.75" deep.

Location: L1 back wall above offset forward area.

LIGHTS - QUARTZ

Whelen Pioneer 12V LED Flood Light [Qty: 2]

A Whelen Pioneer Plus series 12V flood light model PFP2 dual panel light head shall be provided on a Quest cab brow mount.

The light shall be located driver and officer side front cab brow, driver and officer side over rear cab door.

RECEPTACLES

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Receptacle

A 20 amp, 110 volt 3-prong straight blade NEMA 5-20 duplex household receptacle with stainless steel cover plate shall be installed in a non-weather exposed area as specified by the department. The receptacle shall be wired to the inlet receptacle where it will have overcurrent protection from an external source.

Location: In cab driver side on 3 x 3 post rear facing just above engine cover, In cab officer side on 3 x 3 post rear facing just above engine cover.

Receptacle

A 20 amp, 110 volt model FP-11 FirePower receptacle with a weatherproof cover plate shall be installed as specified by the department.

Location: driver side rear wheel well offset forward, officer side rear wheel well offset forward, over driver forward compt for portable light, over officer forward compt for portable light, over driver rearward compt for portable light, over officer rearward compt for portable light.

ELECTRIC CORD REELS

Cord Reel Rollers

Stainless steel cord reel rollers shall be installed and located on the reel.

The rollers shall facilitate smooth removal of the electric cord.

Electric Cord Reel

Hannay electric rewind cord reel(s) (ECR 1616-17-18) shall be installed and located B1 back wall up high offset driver side.

The reel(s) shall include 200' of yellow 10 gauge 3 conductor type SOWA cord. The cord shall be rated at 20 amps @ 110 volts. The end of the cord shall be terminated for the installation of a department required connector.

Circle D Junction Box

A Circle D power box with four (4) FirePower receptacles NEMA L5-15 shall be hardwired to the cord reel. The receptacles shall be enclosed in a UL listed, NEMA Type 3R cast aluminum box with aluminum finishes and NFPA required indicator light.

Located on cord for reel in B1 back wall up high offset driver side.

Cord Reel Rewind Switch

A heavy duty rubber covered electric reel rewind button shall be installed on wall near cord reel.

AERIAL MODEL

50' Mid Mounted Aerial Device

Aerial Ladder Requirements

It is the intent of these specifications to describe a telescopic aerial ladder of the closed boom design that is compliant with NFPA 1901 (2009 edition) chapter 19 sections 19.2 through 19.6 and sections 19.17 through 19.25. Some portions of this specification exceed minimum NFPA recommendations and are to be considered a minimum requirement to be met.

The aerial device shall be mounted in the middle of the apparatus to minimize impact on the hosebed. The only obstacle in the hosebed shall be the cradle support for the boom. A three-section design is desired to minimize rear body overhang.

The aerial ladder shall consist of three (3) welded extruded aluminum telescopic boom sections operating from -10 degrees to 85 degrees and designed to provide continuous egress for firefighters and civilians from an elevated position to the ground.

The aerial device shall have a vertical height of 50' at full extension and elevation. The measurement of height shall be consistent with NFPA 1901 section 19.2.2.

The rated horizontal reach shall be 42'. The measurement of horizontal reach shall be consistent with NFPA 1901 19.2.3. The measurement shall be from the outermost rung at full extension to the centerline of turntable rotation.

The aerial shall have a maximum stabilizer spread of 9' - 10".

The ladder shall be able to provide full operating capacities in up to 35 mph wind conditions.

Aluminum Aerial Device

The aerial device shall exceed the requirements of NFPA 1901 19.2 Aerial Apparatus Standard. To ensure a high strength-to-weight ratio and an inherent corrosion resistance, the aerial device shall be completely constructed of 6061T6 aluminum alloy U-channels welded together to provide three (3) telescopic boom assemblies. The boom assemblies shall be securely welded together at the center of each side by a continuous MIG welding process. All material shall be tested and certified by the material supplier. Structural rivets or bolts shall not be utilized in the boom weldment sections.

Due to the unpredictable nature of fireground operations, a minimum safety factor of 2.5 to 1 is desired. This structural safety factor shall apply to all structural aerial components including turntable and torque box stabilizer components. Definition of the structural safety factor shall be as outlined in NFPA 1901 A.19.20.1:

DL = Dead load stress. Stress produced by the weight of the aerial device and all permanently attached components.

RL = Rated capacity stress. Stress produced by the rated capacity load of the ladder.

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WL= Water load stress. Stress produced by nozzle reaction force and the weight of water in the water delivery system.

FY = Material yield strength. The stress at which material exhibits permanent deformation.

$$2.5 \times DL + 2.5 \times RL + 2.5 \times WL \text{ equal to/less than } FY$$

The minimum NFPA specification is exceeded in this paragraph by requiring safety margin above 2 to 1 while flowing water.

The stability factor or tip over safety margin shall be a minimum of 1.5 to 1 as defined by NFPA 1901 19.21.

An independent engineering firm shall verify the safety factor of the telescopic boom assemblies and all primary support structure. Design verification shall include computer modeling and analysis, and extensive strain gauge testing performed by an independent registered professional engineer. Verification shall include written certification from the independent engineering firm made available by the manufacturer upon request from the purchaser.

All welding of aerial components, including the aerial boom sections, turntable, torque box and outriggers shall be performed by welders who are certified to American Welding Society Standards D1.1, D1.2 and D1.3 as outlined in NFPA 1901 19.22.3.1.

The weldment assemblies of each production unit shall be tested visually and mechanically by an ASNT certified level II non-destructive test technician to comply with NFPA 1901 19.22.2. Testing procedures shall conform to the American Welding Society Standard B1.10 Guide for non-destructive testing. Test methods may also include dye penetrate, ultrasound and magnetic particle where applicable.

Boom Mounted Rescue Ladder

The boom shall be supplied with an Alco-Lite aluminum three (3) section telescopic ladder mounted to the top of the boom. The last 24" of the fly section shall be angled down 19 degrees to facilitate access to and egress from the ladder tip.

The ladder rungs shall be designed to eliminate the need for rubber rung covers. The rungs shall be spaced on 14 inch centers and have an integral skid-resistant surface as outlined in NFPA 1901 19.2.5 through 19.2.5.3. The minimum design load shall be 500 pounds distributed over a 3 1/2" wide area as outlined in NFPA 1901 19.2.5.4.

The ladder shall have the following dimensions to meet NFPA 1901 19.2.6 and 19.2.8 governing ladder section dimensions:

Section	Width	Height
Base Section	24-1/2"	12"
Second Section	21"	12"
Fly Section	18"	12"

Ladder Tip Step

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Two (2) split design folding steps shall be located near the ladder tip to provide a position for a firefighter using the monitor as outlined in NFPA 1901 19.2.9. The steps shall have a raised surface for traction and cut outs for deployment.

Aerial Extension Mechanism

Both power extension and retraction shall be furnished and meet the requirements of NFPA 1901 section 19.19 and 19.20. Extension shall be by way of a single extension cylinder mounted on top of the base boom section. The cylinder shall be located on top of the boom for easy service access.

Cylinder Size

Bore: 2-1/2"
Stroke: 130"

The cylinder shall extend the second boom and operate through a block and tackle cable arrangement to extend and retract the third boom. Maximum extension of the ladder is to be automatically limited by the stroke of the cylinder. The normal operating cable safety factor shall be 5:1 and the stall safety factor shall be 2:1 based on the breaking strength of the cables. The minimum ratio of the diameter of wire rope used to the diameter of the sheave used shall be 1 to 12. The cables shall be treated with Pre-Lube 6 for increased service life.

Ladder Cable Size

2nd section 1/4" 7 x 19 galvanized cable

The boom assembly shall consist of three (3) separate weldments that shall extend and retract within each other. A low friction ultra high molecular weight polyethylene (UHMW) type slide pad shall be utilized between the sections. A total of sixteen (16) pads shall be supplied to minimize friction. Four (4) pads shall be supplied at the tip of the base, four (4) at the trailing end of the mid section, four (4) at the tip of the mid section, and four (4) at the trailing end of the fly section.

Aerial Finish

To reduce maintenance expense the aerial shall have a natural aluminum swirled finish. Visible inspection of all ladder weld joints shall be possible without having to remove paint or body filler to reveal the weld bead.

Operation Times

The aerial shall complete the NFPA 1901 19.13.5 time test in 105 seconds. This test involves raising the aerial from the bedded position to full elevation and extension and rotating to 90 degrees. This test is to begin with the stabilizers deployed.

Time to extend ladder	maximum 25 seconds
Time to retract ladder	maximum 25 seconds
Time to raise ladder	maximum 25 seconds
Time to lower ladder	maximum 25 seconds
Time to rotate 180 degrees	maximum 55 seconds

Aerial Ladder Rated Capacity

The aerial device shall have a rated capacity of 400 lbs. consistent with NFPA 1901 19.3.1 through 19.3.2. The rated capacity shall include 250 lbs. in personnel allowance and 150 lbs. for equipment mounted at the tip of the ladder. The aerial device shall be rated in multiple configurations as outlined in NFPA 1901 19.3.4. A sign mounted at the operator's position of the aerial shall communicate the following ratings in the unsupported fully extended configuration while maintaining a 2.5 to 1 safety margin as defined in NFPA 1901 A.19.20.1. The loads in each configuration are in addition to 150 lbs. of equipment mounted at the tip.

Condition #1- Tip load only, no water flowing

Elevation	Capacity	Pounds
-10 to 30 degrees	1 person	250 lbs.
31 to 45 degrees	2 people	500 lbs.
46 to 85 degrees	3 people	750 lbs.

Condition #2- Distributed loads no water flowing. (These include one person at the tip)

Elevation	Capacity	Pounds
-10 to 45 degrees	3 people	750 lbs.
46 to 85 degrees	6 people	1500 lbs.

Condition #3- Ladder tip load while flowing 1000 gpm with pre-piped waterway

Elevation	Capacity	Pounds
-10 to 45 degrees	0 people	0 lbs.
46 to 85 degrees	1 person	250 lbs.

Aerial Waterway System

A 1000 gpm pre-piped waterway shall be supplied as outlined in NFPA 1901 19.6. The waterway shall telescope to the end of the fly section. A 4" waterway supply inlet at the base of the torque box shall run through the turntable and a swivel joint to connect with dual 2 1/2" flexible stainless steel waterway tubes. The flexible waterway tubes at the base shall connect the boom mounted waterway pipes to the rotation swivel. The waterway tubes shall have the following sizes:

Base Section:	4" OD
Mid Section:	3-1/2" OD
Fly Section:	2-7/8" OD

The tubes shall be constructed of hard coat anodized aluminum and shall be telescopic with the aerial ladder through sealed slip joints. A 1-1/2" drain valve shall be installed and operated from below the body on the right side of the apparatus.

Waterway Relief Valve

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An automatic relief valve preset at 250 psi shall be installed in the aerial waterway to prevent over-pressurization of waterway system. The relief valve shall be mounted in the lower portion of the waterway where it enters the aerial torque box frame and dumps under the apparatus.

Hydraulic System

The hydraulic plumbing shall consist of stainless steel hydraulic tubing wherever possible to eliminate hose wear and provide a stronger medium to carry the hydraulic fluid. All hydraulic tubing shall be constructed of stainless steel and have a 4 to 1 safety rating based on burst pressure.

An interlock device shall be provided to prevent activation of the aerial ladder hydraulic pump until either the transmission is placed in neutral and the parking brake is set, or the transmission is placed in drive and the rear driveline is disengaged as outlined in NFPA 19.17.3.

The hydraulic system shall be of the latest design and incorporate features to minimize heat build up and provide smooth control of the aerial ladder. The system shall meet the performance requirement in NFPA 1901 19.19.6 and 19.19.7, which requires adequate cooling under 2 1/2 hours of operations.

All hydraulic components that are non-sealing whose failure could result in the movement of the aerial shall comply with NFPA 1901 19.19.1 and have burst strength of 4 to 1. Dynamic sealing components whose failure could cause aerial movement shall have a margin of 2 to 1 on maximum operating pressure per NFPA 1901 19.19.1.1. All hydraulic hoses, tubes and connections shall have minimum burst strength of 3 to 1 per NFPA 1901 19.19.2.

A hydraulic oil pressure gauge shall be supplied at the operator's control location per NFPA 1901 19.19.4. In addition, an aerial hour meter shall be supplied at the operator's console per NFPA 1901 19.19.8. A hydraulic oil level gauge shall be supplied at the pump panel for easy fluid level verification. The three (3) light system shall indicate "full" with a green light, "ok" with yellow light, and "low oil level" with a red light.

Hydraulic power for all operations shall be supplied by a chassis-mounted positive displacement pump for consistent pressure and rapid response. The positive displacement vane pump shall be able to supply five (5) gallons per minute at a maximum pressure of 3000 psi. The system shall operate between 1000 and 2500 psi with flow controls to protect hydraulic components and incorporate a relief valve set at 2800 psi to prevent over-pressurization.

The hydraulic system shall consist of a nine (9) gallon reservoir mounted to the torque box and plumbed to the hydraulic pump. The tank shall be supplied with a removable top to access tank strainer filter. There shall be plumbing for a supply and return line and a tank drain on the reservoir. The reservoir cap shall be marked per NFPA 1901 19.19.5.2. Gated valves under the tank shall facilitate filter changes.

The hydraulic system shall use 5w-20 multi-weight, SAE 32 grade oil and incorporate the following filters to provide dependable service:

Reservoir Breather: 10-micron
Magnetic Reservoir Strainer: 125-mesh

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Pressure Filter (Torque Box): 3-micron
Return Filter: 10-micron

The aerial hydraulic system shall be designed in such a manner that a hydraulic pump failure or line rupture shall not allow the aerial or outriggers to lose position. Hydraulic holding valves shall be mounted directly on cylinders. To ensure reliable performance of holding valves, no hoses shall be permitted between a holding valve and cylinder.

The aerial shall incorporate the use of stainless steel tubes inside the torque box and jacklegs to minimize the possibility of hydraulic leaks. The stainless steel tubes shall be installed inside the torque box to prevent damage from the elements.

Hydraulic power to the ladder shall be transferred from the torque box by a hydraulic swivel.

Emergency Pump

The hydraulic system shall be designed with an auxiliary power unit meeting the guidelines of NFPA 1901 19.18.7. The auxiliary power unit shall be a 12-volt pump connected to the chassis electrical system. The pump shall provide operation at reduced speeds to store the aerial device and stabilizers for road transportation. Self-centering switches shall be provided at the turntable and each stabilizer control station to activate the system. The system shall be designed to provide a minimum of five (5) minutes of hydraulic power to operate functions.

Aerial Torque Box

A mainframe torque box assembly shall be provided between the pump panel and the chassis cab to mount the aerial device. The torque box shall be bolted to the chassis frame with grade 8 bolts and contain all the aerial components. The box shall be constructed of 3/16" 50,000 psi minimum yield steel. The stabilizer inner tubes shall be attached to the backside of the torque box assembly. The top of the torque box shall be designed to mount a rotation bearing and turntable assembly.

Stabilization

The aerial shall incorporate an "A" frame type stabilizer system that utilizes a single hydraulic cylinder to extend and lower the stabilizers. The extension rods of the hydraulic cylinder shall be mounted inside the external stabilizer tube for protection.

The stabilizers shall have a maximum spread of 9' - 10" when fully extended. The extending tubes shall be 7" square and retract inside an 8" square external tube. The internal jack tubes shall slide on permanently attached wear pads.

The aerial shall have a tip over safety margin of 1 1/2 times its rated load in any position the aerial device can be placed as outlined in NFPA 1901 19.21.2. The aerial shall be able to sustain a 1 1/3 to 1 rated load on a 5 degree slope downward in the position most likely to cause overturning as outlined in NFPA 1901 19.21.3.1.

The cylinders shall be supplied with dual pilot-operated check valves on each stabilizer cylinder to hold the cylinder in the stowed or working position should a charged line be severed at any

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point in the hydraulic system. Stabilizers shall contain safety lock valves. This assures there will be no "leak down" of stabilizer legs. Mechanical pins are not required. This feature contributes to efficient field set-up and operation.

The stabilizer extension cylinders shall have the following dimensions:

Bore: 2.5"
Stroke: 24"

Each stabilizer that can be extended from the body shall be supplied with a red warning light as outlined in NFPA 19.21.4.4. The stabilizers shall be connected to a warning light in the cab to warn the operator if the stabilizers are deployed. A floodlight shall be provided in each stabilizer body opening to illuminate the stabilizer and the ground. The light shall automatically come on with the deployment of the respective stabilizer.

The ground contact area for each stabilizer shall be a 10" x 12" without auxiliary pads and 24" x 24" with stabilizer pads deployed. The ground pressure shall not exceed 75 psi when the apparatus is fully loaded and the aerial device is carrying its rated capacity in every position. This shall be accomplished with the stabilizer pads deployed, as outlined in NFPA 19.21.4.2.

Stabilizer Controls

Two (2) electric solenoid valves shall control the stabilizers. A control switch shall be located on the left side operator's panel and the right side pump panel, so the operator may observe the stabilizers during deployment. An audible alarm with a minimum 87 dBA shall also sound while the stabilizers are in motion as required by NFPA 19.21.4.1.1. Stabilizer deployment shall be completed in less than 90 seconds.

There shall be an interlock that prevents the operation of the ladder until the stabilizers are down and properly set. The interlock system shall be designed to prevent aerial movement until the stabilizers are set. Additionally, the system shall not permit stabilizer movement when the aerial is out of the cradle. This requirement is outlined in NFPA 1901 19.17.5. Two (2) micro switches, one (1) on each stabilizer leg, shall sense when both legs are in firm contact with the ground. This condition shall be indicated when two (2) yellow indicator lights are on and the green interlock light is on. When the apparatus has been leveled, a manual transfer switch shall be used to shift hydraulic power to ladder operations.

To simplify leveling the apparatus, two (2) color-coded level indicators shall be supplied at the operator's console. One (1) indicator shall be for front to rear level and one (1) for side to side level.

Turntable Assembly

A 33" diameter turntable bearing with a 1 7/8" drive gear face shall be bolted to the top of the mainframe torque box assembly with 1/2" diameter Grade 8 plated bolts and connect the turntable and torque box. Gear tooth shall be stub tooth form.

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The turntable assembly shall be an A frame design constructed of high strength steel and shall attach to the turntable rotation bearing and the base of the aerial device. The turntable shall attach the elevation cylinder and boom base with hardened steel pins and bushings.

Elevation Mechanism

A 5" bore 23-1/2" stroke elevating cylinder shall be mounted on the inside of the turntable assembly. A 1-3/4" pin shall fasten the cylinder to the turntable and a 2" pin to the ladder. The elevating cylinders shall be mounted utilizing composite bearings on both ends of the cylinders. The elevating cylinder shall be provided with a pilot operated check valve to prevent movement of the ladder in case of a loss of hydraulic pressure.

The elevation system shall be designed following NFPA 1901 19.5.1. The elevation hydraulic cylinders shall incorporate cushions on the upper limit of travel. The hydraulic elevation cylinders shall also serve as a locking device to hold the aerial in the stored position for road travel.

Rotation Mechanism

The aerial shall be supplied with a powered rotation system as outlined in NFPA 1901 19.5.2. The hydraulic rotation motor shall provide continuous rotation under all rated conditions and be supplied with a brake to prevent unintentional rotation.

Rotation shall be accomplished by a high torque hydraulic motor driven through a spring-applied hydraulically-released multiple disk brake into a planetary gearbox. The gearbox shall have a minimum continuous torque rating of 34,000 in. lbs. The output shaft shall be splined and shall mate with a spur gear, which shall drive the main ring gear on the turntable bearing. The turntable bearing, ring gear teeth, spur gear, planetary gearbox and output shaft shall have a minimum safety factor of 2.5 to 1.

Hydraulic Swivel

A hydraulic swivel shall be provided for fluid transfer to the aerial cylinders, water delivery and electrical power while permitting continuous 360-degree rotation. The swivel shall provide eight (8) hydraulic circuits, sixteen (16) electrical circuits and a 4" passage for waterflow. The swivel shall be environmentally-sealed to prevent dirt contamination.

Boom Operating Position

An aerial operator's position shall be supplied as outlined in NFPA 1901 19.4. The operator's position shall be located on the left side pump operator's position. The apparatus shall be supplied with labels to warn of electrocution hazard. The control console shall provide a service access panel on the front to access hydraulic and electrical connections. The electrical panel shall be contained in a junction box with labeled wires. The console shall be angled with an etched panel for long service life. The console shall be labeled and supplied with lights for night operation.

Boom Control Levers

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The control levers shall be arranged as outlined in NFPA 19.17.7. The first lever from the left shall be the extension control (forward for extend and back for retract). The second lever shall be for rotation (forward for clockwise and back for counter clockwise). The third handle shall control elevation (forward for down and back for up). The aerial shall employ direct hydraulic controls for precise control and dependable service with minimal electrical functions. A ring around the control console shall be provided to prevent unintentional movement as outlined in NFPA 19.17.6.2.

Rung Alignment Indicator

A light on each side of the ladder base section shall indicate when the ladder rungs are aligned for climbing.

Aerial Alignment Indicator

A control panel indicator light shall indicate when the aerial is aligned for travel bed.

Load Indication System

A lighted elevation/safe load indicator diagram shall be located on the operator's control panel to indicate safe load capacity at any angle of elevation. The safe load indicator shall clearly communicate aerial capacity in any one of the following conditions: tipload, tipload with water flowing, and distributed load at full extension. The chart shall identify capacity using graphic characters to indicate each 250 lb. increment. The chart shall be equipped with lighting and warn of electrocution hazards from power lines and lightning.

ISO Compliance

The manufacturer shall operate a Quality Management System meeting the requirements of ISO 9001:2000.

The International Organization for Standardization (ISO) is a recognized world leader in establishing and maintaining stringent manufacturing standards and values. The manufacturer's certificate of compliance affirms that these principles form the basis for a quality system that unswervingly controls design, manufacture, installation, and service.

The manufacturer's quality systems shall consist of, but not be limited to, all written quality procedures (aka QOP) and other procedures referenced within the pages of the manufacturer's Quality Manual, as well as all Work Instructions, Workmanship Standards, and Calibration Administration that directly or indirectly impacts products or processes. In addition, all apparatus assembly processes shall be documented for traceability and reference. The manufacturer shall also engage the services of a certified third party for testing purposes where required.

If the manufacturer operates more than one manufacturing facility each facility must be ISO certified.

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By virtue of its ISO compliance the manufacturer shall provide an apparatus that is built to exacting standards, meets the customer's expectations, and satisfies the customer's requirements.

A copy of the manufacturer's certificate of ISO compliance for each manufacturing facility shall be provided with the bid.

AERIAL HYDRAULIC SYSTEM OPTIONS

Aerial Hydraulic Oil Level Gauge

A hydraulic oil level gauge shall be supplied for easy fluid level verification. The three-light system shall indicate full oil level with a green light, acceptable oil level with yellow light, and low oil level with a red light. The display shall be located on pump operator's panel.

Filter Isolation Kit

Three (3) valves shall be provided to minimize fluid loss when changing the aerial hydraulic filter elements during routine maintenance. One (1) 1" ball valve shall be installed at the inlet side of the return filter. Two (2) 3/4" check valves shall be installed on the pressure filter, one (1) on the inlet side and one (1) on the outlet side.

MONITORS

1000 GPM Monitor

The aerial ladder shall be equipped with an TFT Typhoon RC electrically controlled monitor with a powder coated silver finish. The monitor shall be equipped with an Master Stream electrically controlled automatic nozzle capable of discharging 250-1,000 gpm at 100 psi nozzle pressure. This waterflow capability shall be available at any extension, elevation, or position without any restrictions while flowing 1,000 gpm. A minimum stability factor of 1.5 to 1 shall be maintained in this configuration.

The operational range of the electric monitor and nozzle shall be 180 degrees through the vertical plane and 90 degrees through the horizontal plane (45 degrees to either side of the aerial ladder center line). The nozzle shall be attached with a tether cable so the nozzle can be removed to connect firefighting handlines.

The monitor shall include an extended vertical travel range to allow operation up to 45 degrees above parallel to the ladder. This feature shall allow water to be directed upwards from the ladder tip.

The monitor relay box shall include solid state components and shall be coated to resist corrosion. The monitor shall have fully enclosed motors and gears with built in manual override capability.

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Control switches for horizontal movement, vertical movement and pattern selection shall be located at the aerial control panel.

Monitor Tip Controls

In addition to the controls at the operator console, electric monitor directional and stream controls shall be installed on the monitor to allow operation by a firefighter on the ladder.

AERIAL WARNING LIGHTS

Outrigger Warning Lights

Trucklite model 21 surface mounted LED outrigger warning light with red lens shall be provided for each outrigger. The lights shall be mounted in the body rubrail just above the outriggers in compliance with current NFPA 1901.

Ladder Tip Warning Lights

Two (2) Whelen Vertex model VTC6R Super-LED light heads with clear lenses shall be supplied and mounted one each side at the ladder tip. The lights shall include model VTCFC chrome flanges.

The lights shall be wired to activate with the aerial master power switch.

AERIAL LIGHTING

Ladder Base Lighting

Two (2) Whelen round 12 Super LED model PFBP12C floodlights with black housing and chrome rear cover shall be mounted one on each side at the bottom of the ladder base section. They shall be controlled from the turntable operating pedestal.

Tip Flood Light

A 12V Whelen model PFBP12C LED flood light with switch shall be provided on the tip of the aerial device. The light shall be located left side tip, right side tip.

WATERWAY OPTIONS

Waterway Inlet

A 4" waterway inlet shall be provided on the right side pump panel. The 4" inlet shall be connected to the aerial waterway with 4" piping. All fabricated piping shall be constructed of a minimum of Schedule 10 stainless steel piping to prevent corrosion of the lines. The threads shall be NST. A long-handle chrome-plated 4" NST cap shall be installed on the inlet. The inlet shall be non-gated.

Waterway Pressure Gauge

One (1) Class 1 weatherproof 3-1/2" compound vacuum pressure gauge with a range of 30-0-600 shall be installed adjacent to the waterway inlet. The function of the gauge is to advise the aerial operator of the pressure within the waterway. The gauge shall be filled with a liquid solution.

Flowminder

The aerial shall be equipped with one (1) Class 1 brand Flowminder for the aerial waterway to digitally display the actual volume of water being discharged in gallons per minute and the total volume of water that has flowed through the waterway.

The readout shall be mounted at the turntable control station.

The Flowminder shall consist of:

- Weatherproof digital flow display with super-bright digits at least 1/2" (0.5") high. The display shall read actual flow and shall switch to total flow when the totalizer button is depressed and held.
- Flow transmitter mounted in the aerial waterway pipe above the swivel. The transmitter shall consist of a weather-resistant black-anodized housing with brass wetted parts with a double paddle wheel.
- Connecting cables to connect the digital display to the flow transmitter and apparatus power.
- Machined mounting hardware to hold the transmitter in position in the discharge line.

The flow meter shall be checked and calibrated prior to delivery of the apparatus.

AERIAL EQUIPMENT

Axe Bracket

An axe bracket shall be provided on the aerial ladder. The bracket shall consist of a stainless steel bracket for the blade (with retaining pin), chrome spring clamp for the handle and a rubber boot for the pick end of the axe. The bracket shall be designed to hold a 6 lb. axe.

Location: left side fly section.

Boom Handrails

The handrails on the boom ladder shall fold down to reduce vehicle travel height by approximately 7.5". A switch shall be provided to activate the hazard light in the cab if the handrails are in the "up" position.

AERIAL TESTING

Third-Party Flow Test

A flow test shall be conducted to determine that the water system is capable of flowing 1,000 gpm at 100 psi nozzle pressure with the aerial device at full extension and elevation. When the aerial apparatus is equipped with a fire pump, the test shall be conducted using the onboard pump. Intake pressure for the onboard pump shall not exceed 20 psi.

In addition to the flow test, a hydrostatic test shall be done on the waterway system. The permanent water system, piping, and monitor shall be hydrostatically tested at the maximum operating pressure required to flow 1,000 gpm at 100 psi nozzle pressure at maximum elevation and extension.

These results shall be certified by an independent, third-party testing organization, per NFPA 16.13.1 through 16.13.1.3.

Aerial Certification

All certification shall be performed by a certification organization that is accredited for inspection and testing systems on fire apparatus in accordance with ISO/IEC 17020, General criteria for the operation of various types of bodies performing inspection or ISO/IEC Guide 65, General requirements for bodies operating product certification systems.

All quality control testing shall be performed by an ASNT-certified level II Non-Destructive Test Technician. The aerial ladder shall be tested in compliance with the current editions of NFPA 1901 and NFPA 1911. All sub-assemblies are to be inspected before assembly and body mounting.

Each aerial section shall be tested prior to the assembly of the complete aerial device. Each section shall be subjected to a visual weld inspection to assure the integrity of the weldment. Die penetrant shall be used as required to qualify suspected weld defect indications. All turntable mounting bolts, cylinder anchor pins, outrigger anchor pins, aerial hinge pins, and other critical mounting components are subjected to ultrasonic testing to detect any flaws.

A magnetic particle test shall be conducted on the torque box, aerial support structure, outriggers, outrigger support structure and all other structural ferrous aerial components. This test shall be performed to assure the integrity of the weldment.

After the aerial is assembled and installed on the vehicle, an operational inspection shall be made and the aerial shall be tested to comply with the applicable standards in the current editions of NFPA 1901 and NFPA 1911.

In addition to the above tests, the aerial shall successfully complete the following operational tests:

- 1) The completed apparatus shall be placed on a firm, level surface with the aerial stabilizers extended and down. The aerial shall lift a test weight equal to the rated tip load capacity, as specified herein, with the aerial at full extension, 0 degrees elevation, and rotated 90 degrees to either side of the truck chassis. The test weight shall be lifted from 0 degrees to 15-20 degrees.

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The test weight shall be suspended from a position equal to the position of the outermost rung of the fly section or the center of the platform when so equipped. The aerial shall lift the test weight smoothly and evenly with no twisting or jerking. This test shall be performed at the normal hydraulic system relief valve setting. No temporary adjustments to the relief valve shall be allowed.

2) The completed apparatus shall be placed on a firm, level surface with the aerial ladder stabilizers extended and down. A test weight equal to 1.5 times the aerial's rated tip load capacity, shall be suspended from a position equal to the position of the outermost rung of the fly section (or center of the platform when so equipped), with the aerial in the straight-ahead position. The aerial shall then be rotated a full 360 degrees around the vehicle with the aerial at full extension and at 0 degrees elevation (or high enough to clear vehicle-mounted equipment). The aerial and vehicle shall show no signs of instability. This test shall be performed with no water in the tank, or hose, ladders, or removable equipment that would act as a counterbalance in order to simulate a worst-case condition.

3) The completed apparatus shall be placed on a firm surface having a minimum 5 degrees side slope with the aerial stabilizers extended and down. A test weight equal to 1.5 times the aerial's rated tip load capacity, shall be suspended from a position equal to the position of the outermost rung of the fly section (or center of the platform when so equipped), with the aerial in the straight-ahead position. The aerial shall then be rotated 90 degrees to the downhill side with the aerial at full extension, 0 degrees elevation (or high enough to clear vehicle-mounted equipment). The aerial and vehicle shall show no signs of instability, and all of the stabilizers shall remain firmly on the ground. This test shall be performed with no water in the tank, or hose, ladders, or removable equipment that would act as a counterbalance in order to simulate a worst-case condition.

4) The completed apparatus shall be placed on a firm, level surface with the aerial stabilizers extended and down. A test weight equal to 2.0 times the aerial's rated tip load capacity, shall be suspended from a position equal to the position of the outermost rung of the fly section (or center of the platform when so equipped), with the aerial in the straight-ahead position at full extension and at 8 degrees elevation (or high enough to clear vehicle-mounted equipment). After ten (10) minutes, the weight shall be removed, and the aerial shall be inspected for any abnormal twist or deflection.

5) The completed apparatus shall be placed on a firm, level surface with the aerial stabilizers extended and down. The aerial will be positioned at full extension at 0 degrees elevation at some position out of the travel rest and off the side or rear of the truck. For units without a pre-piped waterway to the tip, a test weight of 220# shall be applied horizontally and perpendicular to the tip of the aerial at the location of the outermost rung. The rotation brake shall not release nor shall the aerial's deflection exceed the manufacturer's accepted tolerances. For aerials with pre-piped waterways, a test weight of 350# will be applied at the location of water nozzle.

Upon satisfactory completion of all inspections and tests, an independent third-party inspection firm shall submit a certificate indicating that all specified standards have been met.

HAND TOOLS

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Pike Pole Fiberglass

6' Pike Pole

One (1) Ziamatic Plasticore model PCM 6 6' hollow fiberglass pike pole, 1-3/4" (1.75") outside diameter, with painted steel pike shall be supplied.

Pike Pole Fiberglass

8' Pike Pole

One (1) Ziamatic Plasticore model PCM 8, 8' hollow fiberglass pike pole, 1-3/4" (1.75") outside diameter, with painted steel pike shall be supplied.

Pike Pole Fiberglass

10' Pike Pole

One (1) 10' hollow fiberglass pike pole 1-3/4" OD, with a painted steel pike shall be supplied.

GROUND LADDERS

Alco-Lite Folding Ladder

One (1) Alco-Lite FL-10, 10' aluminum folding ladder shall be provided. Both ends shall be equipped with molded rubber feet and the ladder shall have handles for easy carrying. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931.

Alco-Lite Roof Ladder

An Alco-Lite PRL-16, 16' aluminum roof ladder shall be provided. A pair of folding 3/4" (0.75") steel roof hooks shall be attached to one end of the ladder, and a pair of steel spiked feet on the other end. The ladder shall meet or exceed the requirements of the current edition of NFPA 1931.

Alco-Lite Extension Ladder

An Alco-Lite PEL-28, 28' aluminum two-section extension ladder shall be provided.

MISC LOOSE EQUIPMENT

Wheel Chocks

Two (2) Zico model SAC-44 folding wheel chocks for up to 44" diameter tires shall be supplied and located per the customer. The SQCH-44-H horizontal holders and pair of chocks require a minimum storage area of 6" high, 10-1/2" wide and 22-3/8" deep.

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DOT Required Drive Away Kit

Three (3) triangular warning reflectors with carrying case shall be supplied to satisfy the DOT requirement.

EXTERIOR PAINT

Paint Break

The cab shall have a two-tone paint break. The break line shall be located as follows based on cab model.

Typhoon X and CII X cabs: 31.5" below the drip rail.

Pre-07' emission Typhoon cab: 33.5" below the drip rail.

Quest cab: 41.375" up from bottom of cab.

Paint Valve Ends

The valve ends shall be painted job color.

Painted Pump/Pre-Connect Module(s)

The apparatus pump/pre-connect module(s) shall be painted job color.

The paint process shall match what is applied to the body.

Painted Mid-Boom Module

The mid-mount boom body module shall be painted job color. The paint shall be of the highest quality finish for low maintenance, long life, and attractive appearance. The finish shall consist of a corrosion-resistant primer, urethane high build primer, and high performance durable color coat. The vehicle finish shall be protected with a minimum of 2 mils film thickness of UV resistant clear coat.

The paint process shall meet or exceed current State regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water and soil. Manufacturer shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The module exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint. Any vertically or horizontally hinged doors shall not be installed to assure proper paint coverage on the doorjamb and door edges.

The paint process shall feature DuPont Performance Coatings high-solid, low VOC products and be performed in the following steps:

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- Corrosion Prevention - all raw materials shall be pre-treated with the MetaLok-CVP system to provide superior corrosion resistance and excellent adhesion of the top coat.
- DuPont Uro@Prime 1340S™ polyurethane primer shall be applied to guarantee excellent gloss hold-out, chip resistance, and barrier coat corrosion protection.
- DuPont Imron® Elite Express System (Top coat) - a lead free, chromate-free, high-solids polyurethane color coat shall be applied. A minimum of two coats shall be applied providing excellent coverage and durability.
- DuPont High Solids Clear coat TC35000™ - a high-solids, low VOC clear coat shall be applied as the final step. To ensure full gloss, color retention and durability a minimum of two coats shall be applied at 2 mils film thickness minimum.

Any location where the metal is penetrated after painting for the purpose of mounting steps, handrails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting system. The system shall be applied to the sheet metal or extrusions in all locations where the metal has been penetrated. All hardware used in mounting steps, handrails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting system.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20-degree gloss meter and distinction of image meter to assure a smooth mirror like finish.

Paint Custom Cab

The apparatus cab shall be painted Sikkens FLNA6051 Lime Green. The paint process shall meet or exceed current state regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water, and soil. Contractor shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The aluminum cab exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces. Cab doors and any hinged smooth-plate compartment doors shall be painted separately to assure proper paint coverage on cab, door jambs and door edges.

Paint process shall feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention - all aluminum surfaces shall be pre-treated with the Alodine 5700 conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat.
- Sikkens Sealer/Primer LV - acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- Sikkens High Solid LVBT650 (Base coat) - a lead-free, chromate-free high solid acrylic urethane base coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- Sikkens High Solid LVBT650 (Clear coat) - high solid LV clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats shall be applied.

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

Any location where aluminum is penetrated after painting, for the purpose of mounting steps, hand rails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment shall be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, hand rails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20 degree gloss meter. Coating thickness shall be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

Paint Cab Two-Tone Color

The upper section of the cab shall be painted FLNA4145 Black.

The paint process of the secondary cab color shall be the same as the primary color.

Paint Body Small

The apparatus body shall be painted Sikkens FLNA6051 Lime Green. The paint process shall meet or exceed current state regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water, and soil. Contractor shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The aluminum body exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces of the body. Any vertically or horizontally hinged smooth-plate compartment doors shall be painted separately to assure proper paint coverage on body, door jambs and door edges.

Paint process shall feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention - all aluminum surfaces shall be pre-treated with the Alodine 5700 conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat.
- Sikkens Sealer/Primer LV - acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- Sikkens High Solid LVBT650 (Base coat) - a lead-free, chromate-free high solid acrylic urethane base coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- Sikkens High Solid LVBT650 (Clear coat) - high solid LV clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats shall be applied.

Any location where aluminum is penetrated after painting, for the purpose of mounting steps, hand rails, doors, lights, or other specified components shall be treated at the point of

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment shall be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, hand rails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20 degree gloss meter. Coating thickness shall be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

Aerial Paint

The lift cylinders, extension cylinders and upper turntable steelwork (less turntable) shall be painted to match the primary job color.

INTERIOR PAINT

Cab Interior Paint

The interior of the cab shall be painted Zolatone gray #20-64. Prior to painting, all exposed interior metal surfaces shall be pretreated using a corrosion prevention system.

STRIPING

Reflective Tape on Stabilizers

The two aerial ladder stabilizers which protrude beyond the side of the body shall be striped with white reflective tape. The tape shall be visible from the front and rear of the unit.

Striping

Reflective striping shall be provided and installed by the dealer. The stripe shall match current OFC 's Quest Pumper

Gold leaf lettering shall be supplied and applied to match OFC's current Quest Pumper

Scotchlite Chassis Stripe

Scotchlite chassis stripe shall be 3/4" White Scotchlite. Stripe shall be centrally located and shall contour with the chassis, following the paint break.

Rear Body 3M Diamond Grade Striping

Chevron style 3M Diamond Grade striping shall be provided on the rear of the apparatus. The stripes shall consist of 6" Red/Fluorescent Yellow Green alternating stripes in an "A" pattern.

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The striping shall be located on the rear facing extrusions, panels and doors inboard and outboard of the beavertails if applicable.

WARRANTY / STANDARD & EXTENDED

Standard 1 Year Warranty

The apparatus manufacturer shall provide a full 1-year standard warranty. All components manufactured by the apparatus manufacturer shall be covered against defects in materials or workmanship for a 1-year period. All components covered by separate suppliers such as engines, transmissions, tires, and batteries shall maintain the warranty as provided by the component supplier. A copy of the warranty document shall be provided with the proposal.

Lifetime Frame Warranty

The apparatus manufacturer shall provide a full lifetime frame warranty. This warranty shall cover all apparatus manufacturer designed frame, frame members, and cross-members against defects in materials or workmanship for the lifetime of the covered apparatus. A copy of the warranty document shall be provided with the proposal. Frame warranties that do not cover cross-members for the life of the vehicle shall not be acceptable.

10 Year 100,000 Mile Structural Warranty

The apparatus manufacturer shall provide a comprehensive 10 year/100,000 mile structural warranty. This warranty shall cover all structural components of the cab and/or body manufactured by the apparatus manufacturer against defects in materials or workmanship for 10 years or 100,000 miles, whichever occurs first. Excluded from this warranty are all hardware, mechanical items, electrical items, or paint finishes. A copy of the warranty document shall be provided with the proposal.

10 Year Stainless Steel Plumbing Warranty

The apparatus manufacturer shall provide a full 10-year stainless steel plumbing components warranty. This warranty shall cover defects in materials or workmanship of apparatus manufacturer designed foam/water plumbing system stainless steel components for 10 years. A copy of the warranty document shall be provided with the proposal.

10 Year Paint and Corrosion Warranty

The apparatus manufacturer shall provide a 10-year limited paint and corrosion perforation warranty. This warranty shall cover paint peeling, cracking, blistering, and corrosion provided the vehicle is used in a normal and reasonable manner.

The paint shall be prorated for 10 years as follows:

Topcoat & Appearance: Coating System, Adhesion & Corrosion:
Gloss, Color Retention, Cracking Includes Dissimilar metal corrosion, Flaking,

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		Blistering, Bubbling	
0 to 72 months	100%	0 to 36 months	100%
73 to 120 months	50%	37 to 84 months	50%
		85 to 120 months	25%

Corrosion perforation shall be covered 100% for 10 years. Corrosion perforation is defined as complete penetration through the exterior metal of the apparatus.

The warranty period shall begin upon delivery of the apparatus to the original user-purchaser. A copy of the warranty document shall be provided with the proposal.

UV paint fade shall be covered in a separate warranty supplied by Akzo Nobel (Sikkens) and shall be for a minimum of 10 years.

20 Year Aerial Device Structural Warranty

The aerial manufacturer shall provide a 20 year structural integrity warranty on the aerial device. This warranty shall cover structural components and shall be extended for a period of 20 years after the date on which the vehicle is delivered to the original purchaser. A copy of the warranty document shall be provided with the proposal. Please refer to warranty document for complete details and exclusions.

SUPPORT, DELIVERY, INSPECTIONS AND MANUALS

PM Service

Pm Service on the chassis, pump and aerial shall provided and done once a year for a 5 year period by Absolute Fire Protection Co. INC.

Inspection Trips

A Prebuild Conference trip for four (4) members of the Ocean FC #1 personnel shall be made to the facility with in 30 days of order of the apparatus. Air travel, meals and lodging expenses shall be included in the bid proposal..

A final inspection trip for four (4) members of the Ocean Fire Co #1 personnel shall be made to the facility at the completion of construction of the apparatus. Air travel, meals and lodging expenses shall be paid included in the bid proposal...

Training

The manufacturer shall provide three (3) days of training covering vehicle maintenance and operational familiarization.

This training shall be provided by a full time, manufacturer employee trainer who specializes in aerial training.

Approval Drawings

A general arrangement drawing depicting the vehicles appearance shall be provided. The drawing shall consist of left side, right side, front, and rear elevation views.

Vehicles requiring pump controls shall include a general arrangement view of the pump operator's position, scaled the same as the elevation views.

Electronic Manuals

Two (2) copies of all operator, service, and parts manuals **MUST** be supplied at the time of delivery in electronic format (CD-ROMs) -NO EXCEPTIONS! The electronic manuals shall include the following information:

- Operating Instructions, descriptions, specifications, and ratings of the cab, chassis, body, aerial (if applicable), installed components, and auxiliary systems.
- Warnings and cautions pertaining to the operation and maintenance of the fire apparatus and fire fighting systems.
- Charts, tables, checklists, and illustrations relating to lubrication, cleaning, troubleshooting, diagnostics, and inspections.
- Instructions regarding the frequency and procedure for recommended maintenance.
- Maintenance instructions for the repair and replacement of installed components.
- Parts listing with descriptions and illustrations for identification.
- Warranty descriptions and coverage.

The CD-ROM shall incorporate a navigation page with electronic links to the operator's manual, service manual, parts manual, and warranty information, as well as instructions on how to use the manual. Each copy shall include a table of contents with links to the specified documents or illustrations.

The CD must be formatted in such a manner as to allow not only the printing of the entire manual, but to also the cutting, pasting, or copying of individual documents to other electronic media, such as electronic mail, memos, and the like.

A find feature shall be included to allow for searches by text or by part number.

These electronic manuals shall be accessible from any computer operating system capable of supporting portable document format (PDF). Permanent copies of all pertinent data shall be kept file at both the local dealership and at the manufacturer's location.

NOTE: Engine overhaul, engine parts, transmission overhaul, and transmission parts manuals are not included.

Fire Apparatus Safety Guide

Fire Apparatus Safety Guide published by FAMA, latest edition. This safety manual is intended to point out some of the basic safety situations that may be encountered during the normal operation and maintenance of a fire apparatus and to suggest possible ways of dealing with these

Specification for: BOROUGH OF POINT PLEASANT BEACH 1

situations. This manual is NOT a substitute for the E-ONE's fire apparatus operator and maintenance manuals or commercial chassis manufacturer's operator and maintenance manuals.



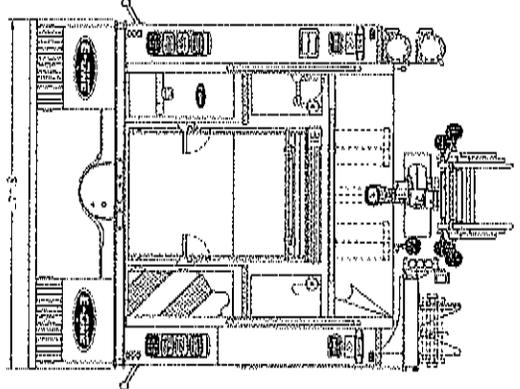
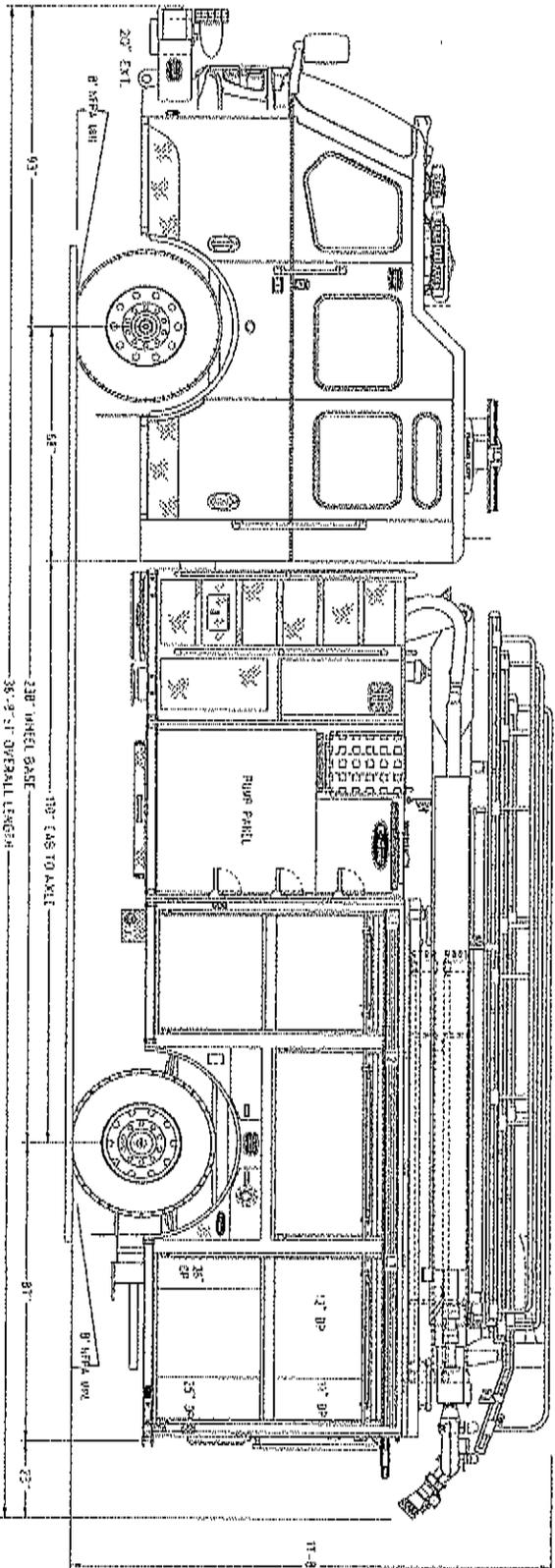
BOROUGH OF POINT PLEASANT BEACH POINT PLEASANT BEACH, NJ

50' BOOM AERIAL BODY
QUEST CHASSIS
50' MID-MOUNT BOOM

COMP. /	OPENING	INTERIOR	DECKING	WHEEL LOAD
U/R	34W	60H	36W	2500 LB
L/R	54W	20H	55W	1100 LB
R/S	48W	50H	36W	2500 LB
B	36W	48H	36W	2500 LB

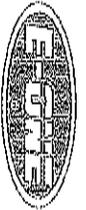
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SEE DETAIL (FOR REFERENCE ONLY) TO TAILBOARD, 60" TO GROUND, E.L.



11'-0" E.L.
11'-0" E.L.
MINIMUM 5' CLEARANCE

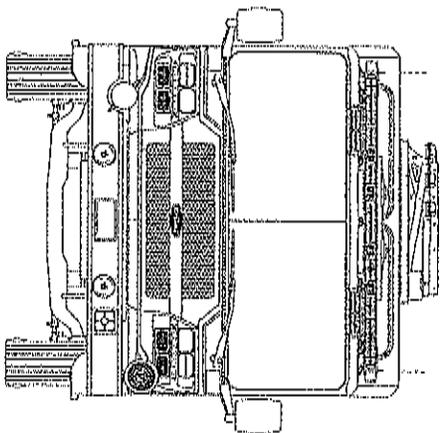
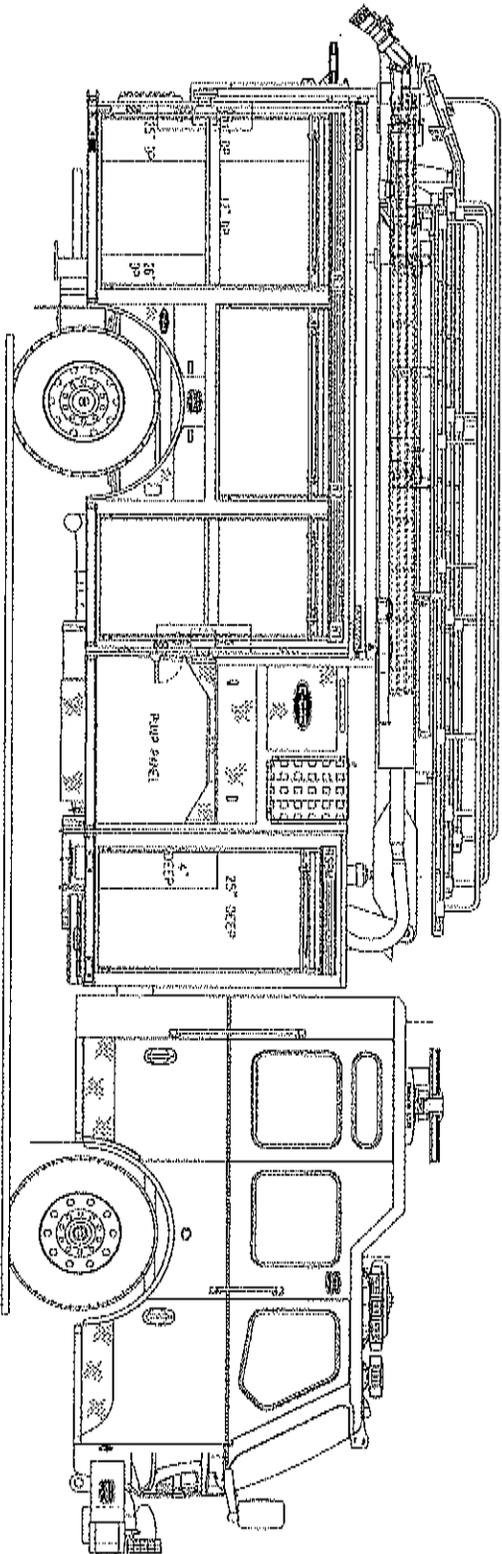
NO.	DESCRIPTION	DATE
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2	REVISED	10/1/20
3	REVISED	10/1/20



BOROUGH OF POINT PLEASANT BEACH POINT PLEASANT BEACH, NJ

50' BOOM AERIAL BODY
QUEST CHASSIS
50' MID-MOUNT BOOM
066468

This drawing is for reference purposes only. Dimensions are subject to change without notice to manufacturing instructions. This print is the property of Empire Fire One, Inc. and is loaned to you subject to return on request. All drawings are subject to change without notice. All dimensions are in inches unless otherwise noted. All dimensions are to be taken from the outside of the object unless otherwise noted. All dimensions are to be taken from the outside of the object unless otherwise noted.



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